EDISON
Electric Institute
BULLETIN

SEPTEMBER, 1935

STATISTICAL DATA OF THE ELECTRIC LIGHT AND POWER INDUSTRY

Compiled Monthly by the Edison Electric Institute—Covers 100% of the Industry

DURING THE MONTH OF JULY (Preliminary)

	1935	1934	%
Kilowatt-hours Generated* (net)			
By Fuel	4,501,297,000	4,712,681,000	− 4.5
By Water Power	3,195,497,000	2,324,657,000	+37.5
Total Kilowatt-hours Generated	7,696,794,000	7,037,338,000	+ 9.4
Additions to Supply			
Energy Purchased from Other Sources	194,011,000	161,404,000	+20.2
Net International Imports	63,528,000	74,868,000	−15.1
Total	257,539,000	236,272,000	+ 9.0
Deductions from Supply			
Energy Used in Electric Railway Departments	42,179,000	46,404,000	− 9.1
Energy Used in Electric and Other Departments	115,489,000	110,945,000	+ 4.1
Total	157,668,000	157,349,000	+ 0.2
Total Energy for Distribution	**7,796,665,000**	**7,116,261,000**	**+ 9.6**
Energy Lost in Transmission, Distribution, etc.	**1,531,293,000**	**1,307,955,000**	**+17.1**
Kilowatt-hours Sold to Ultimate Consumers	**6,265,372,000**	**5,808,306,000**	**+ 7.9**
Sales to Ultimate Consumers (kw-hrs)			
Domestic Service	1,051,873,000	955,691,000	+10.1
Commercial—Small Light and Power (Retail)	1,127,634,000	1,060,357,000	+ 6.3
Commercial—Large Light and Power (Wholesale)	3,468,026,000	3,211,654,000	+ 8.0
Municipal Street Lighting	170,435,000	150,464,000	+13.3
Railroads—Street and Interurban	329,322,000	324,082,000	+ 1.6
Railroads—Electrified Steam	67,214,000	53,513,000	+25.6
Municipal and Miscellaneous	50,868,000	52,545,000	− 3.2
Total Sales to Ultimate Consumers	6,265,372,000	5,808,306,000	+ 7.9
Total Revenue from Ultimate Consumers	$151,214,800	$146,529,400	+ 3.2

DURING TWELVE MONTHS ENDING JULY 31st

Kilowatt-hours Generated* (net)			
By Fuel	52,769,683,000	52,386,385,000	+ 0.7
By Water Power	34,980,435,000	30,692,259,000	+14.0
Total Kilowatt-hours Generated	87,750,118,000	83,078,644,000	+ 5.6
Purchased Energy (net)	2,888,876,000	3,330,225,000	−13.3
Energy Used in Electric Railway and Other Departments	1,973,662,000	1,985,116,000	− 0.6
Total Energy for Distribution	**88,665,332,000**	**84,423,753,000**	**+ 5.0**
Energy Lost in Transmission, Distribution, etc.	**15,279,127,000**	**14,613,174,000**	**+ 4.6**
Kilowatt-hours Sold to Ultimate Consumers	**73,386,205,000**	**69,810,579,000**	**+ 5.1**
Total Revenue from Ultimate Consumers	**$1,879,108,800**	**$1,808,943,200**	**+ 3.9**
Important Factors			
Percent of Energy Generated by Waterpower	39.9%	36.9%	
Average Pounds of Coal per Kilowatt-hour	1.44#	1.45#	
Domestic Service (Residential Use)			
Average Annual Consumption per Customer (kw-hr)	652	617	+ 5.7
Average Revenue per kw-hr (cents)	5.17¢**	5.37¢	− 3.7
Average Monthly Bill per Domestic Customer	$2.81	$2.76	+ 1.8

BASIC INFORMATION AS OF JULY 31st

Generating Capacity (kw)—Steam	23,712,020	23,917,900	
—Waterpower	8,955,693	9,006,600	
—Internal Combustion	499,939	468,800	
Total Generating Capacity in Kilowatts	33,167,652	33,393,300	
Number of Customers			
Farms in Eastern Area (Included with Domestic)	(549,494)	(514,016)	
Farms in Western Area (Included with Commercial—Large)	(215,057)	(209,301)	
Domestic Service	20,859,006**	20,294,276	
Commercial—Small Light and Power	3,749,769	3,708,465	
Commercial—Large Light and Power	506,076	529,715	
Other Ultimate Consumers	67,403	65,998	
Total Ultimate Consumers	25,182,254	24,598,454	

* By courtesy of the U. S. Geological Survey with deductions for certain plants not considered Electric Light and Power Enterprises.
** Revised, following a mid-year analysis of this particular classification.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume III SEPTEMBER, 1935 No. 9

Institute Will Lead in Court Test of Utility Laws

Messrs. Davis, Baker, Beck and Johnston Retained—Cases to Be Expedited — President McCarter Makes Official Statement on the Institute's Policy

At a meeting held on September 12th, the Board of Trustees of the Edison Electric Institute decided that the question of the constitutionality of the Federal statutes adversely affecting the electric light and power industry should be judicially determined as soon as possible. To that end, the Institute has retained the Honorable John W. Davis of New York, the Honorable Newton D. Baker of Cleveland, the Honorable James M. Beck of Washington, D. C., and the Honorable Forney Johnston of Birmingham.

Mr. Davis is to participate in the contest of the validity and constitutionality of the Public Utility Act of 1935, the so-called Wheeler-Rayburn law.

Mr. Baker will take part in cases against the gift and loan of Federal money to induce or enable municipalities to compete with private companies.

MR. DAVIS

Mr. Beck and Mr. Johnston will argue, before the Supreme Court of the United States in the case now pending, the constitutionality of the acts under which the Tennessee Valley Authority is spending huge sums "of the taxpayers' money in its effort to further the doctrine of the abolition of private business for profit."

A formal statement of the policy of the Institute in these matters was made by President McCarter following the meeting of the Board. Mr. McCarter said:

"IN addition to the imposition of largely increased and discriminatory taxation, recent Federal legislation has attacked the electric industry in three different ways, as follows:

"*1st.* The Public Utility Act of 1935,

MR. BAKER

MR. JOHNSTON

MR. BECK

or, as it is familiarly called, the Wheeler-Rayburn Holding Company Act. This Act will injure the interests of the consuming public, directly affect the security of the present employment of 250,000 people, and may injure, perhaps to the point of destruction, the rights of a large portion of utility investors. The enactment is an ambiguous, involved, contradictory and unworkable law. It places practically the absolute control and management of a local industry in the hands of Federal bureaus in Washington. To a large extent, merely because the stock of the local company, doing a local business, is owned by a holding company domiciled in another state, it provides for Federal domination of matters subject to state jurisdiction.

"It attempts by legislative fiat to correct alleged abuses which, if existing in the past, have already, in the main, been corrected by the operation of economic law and the Federal Securities Act. It is an attempt to so weaken the smaller operating companies in securing essential financing, engineering, accounting and construction services as to render such operating companies more vulnerable to the attack of the professional advocates of Government and political ownership. It excludes from its provisions all Government or publicly owned plants, thus legalizing and perpetuating the unfair competition of such agencies against private owners.

"The enactment gives to Federal bureaus broad and practically unrestricted powers over the welfare of the consuming and investing public, whose rights may be determined or dissipated according to the whim and fancy of such bureaus. This law was enacted despite the fact that the total money value of the interstate power at present unregulated amounts only to about $4,000,000 a year. The Federal bureaus have initially asked for approximately one-half of this amount for administration costs. The law will also add many millions of dollars to the annual expenses of operation of the companies, which expense would, in the main part, be borne by the consuming public, and certainly would retard, if not prevent, a continuation of the record of progressive rate reductions made by the industry over a period of years.

"2nd. That portion of the National Recovery Act which purports to give the Government the right, by gift or loan, to aid municipalities in erecting power plants to compete with existing facilities. For this purpose, many millions of dollars have already been expended or appropriated by the Government.

"3rd. The Tennessee Valley Authority legislation, which seeks to put the Government directly in the power business, involving the destruction of existing facilities.

"In the opinion of eminent counsel, the greater part of this legislation is unconstitutional. The power program of the Federal Government involves the expenditures of billions of dollars which, in the main, is to harass and destroy private operation in the electric light and power industry in the United States, despite the fact that the people of this country enjoy the most efficient and widespread electric service, at reasonable rates, of any people in any country. Such service is the envy of the entire world and has resulted from private initiative without Government subsidy. That the industry is well-builded is best attested by the fact that it has never borrowed from the Reconstruction Finance Corporation. If not suffocated by Government meddling, the industry will continue its splendid record. It is inconceivable that this wasteful and destructive expenditure of the taxpayers' money should be continued.

"The board of trustees of the Edison Electric Institute has determined that the question of the constitutionality of these statutes should be presented to the courts at the earliest opportunity, in order that the rights of all may be judicially determined in accordance with the law of the land. To that end it has retained the services of the Honorable John W. Davis of New York to participate in the conduct of the case or cases which will contest the validity and constitutionality of the Public Utility Act of 1935. It has retained the services of the Honorable Newton D. Baker of Cleveland, Ohio, to participate in the conduct of the case or cases which will contest the validity and constitutionality of the gift and loan of Federal money to induce or enable municipalities to compete with private companies now rendering efficient service throughout the United States. It has retained the services of Mr. Forney Johnston of Birmingham, Ala., and the Honorable James M. Beck of Washington, D. C., to argue before the Supreme Court of the United States in the case now pending the constitutionality of the acts under which the Tennessee Valley Authority is spending huge sums of the taxpayers' money in its effort to further the doctrine of the abolition of private business for profit.

"The electric industry, to the extent that it is represented by the Edison Electric Institute, is of the opinion that it is its duty, in fairness to all, to assert and maintain its legal rights to continue to live and serve the people of the nation, subject to reasonable regulation by proper governmental authority, but that it will not and cannot acquiesce in having its properties confiscated merely to advance a theory of state socialism, already proven inimical to the rights of the American people."

The Utilities' Position

An Editorial from the New York Journal of Commerce of Sept. 13, 1935

"The people of this country enjoy the most efficient and widespread electric service, at reasonable rates, of any people in any country."

"This statement is found in the Edison Electric Institute's announcement yesterday of its intention to attack the Public Utility Act, the Tennessee Valley Authority legislation and the making of Federal loans for the construction of municipal power plants, in the courts. It emphasizes a point that was too often overlooked in the heat of the political battle over utility legislation at the last session of Congress. Private development of the electric light and power business under holding company leadership has a definite record of accomplishment to its credit. Specific instances of abuse that have been uncovered are to be strongly condemned, and reasonable regularity measures should be taken to prevent their recurrence. But a national utility policy should not be based solely upon these past abuses. Rather, it should reflect chiefly the fundamental need for the provision of an adequate supply of electric power at moderate cost to the nation's consumers.

"The utilities contend that the entry of the Government into the utility business to establish 'yardsticks' on a highly subsidized basis will hamper rather than advance the further evolution of our power system. They contend further that the wholesale dissolution of major holding companies is wholly unnecessary to prevent a recurrence of past abuses, while it will disrupt the orderly development of a number of operating subsidiaries. These contentions deserve serious consideration.

"Many critics of the utilities would have this country cut off its nose to spite its face when dealing with the power issue. The time has come to consider this vital national issue dispassionately, in the light of the basic economic need for an efficient and expanding industry to supply the needs for plentiful and cheap power of the most highly electrified nation on earth."

Provisions of the Public Utility Act of 1935

As Affecting Operating Electric Companies

EDITOR'S NOTE: The following summary of Title II of the Public Utility Act of 1935, prepared by the Committee of Public Utility Executives, covers the more salient features of the measure, in so far as it applies to operating electric companies *as such*. There are other provisions of the Act which affect operating companies because they are subsidiaries of holding companies, but most of these are covered in Title I. As it is impossible to present a complete discussion in a brief analysis of this intricate and obscurely worded Act, a study of any special question can only be made by a detailed reference to the pertinent sections of the Act itself. The Edison Electric Institute will attempt to answer any question relating to the Act if the same is submitted in writing.

TITLE II

Federal Power Act

Title II of the Public Utility Act of 1935 is in the form of an amendment to the present Federal Water Power Act. It consists of three parts: Part I comprising amendments to specific sections of the Federal Water Power Act; Part II which provides for regulation of electric utility companies deemed to be engaged in interstate commerce; and Part III entitled "Procedural and Administrative Provisions" which imposes additional regulation on licensees under the Federal Water Power Act and electric utility companies regulated under Part II, and which also sets up the procedural and administrative features of the Federal Power Act. Part I of Title II and the effect on "licensees" of the provisions of Part III of Title II will not be considered in this discussion since they supplement the present Federal Water Power Act and can therefore be discussed only in connection with that Act.

Title II of the Act has no direct application to holding companies which are not also electric operating companies. It has no application to gas operating companies. Section 201(b) provides that Part II of Title II shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce, and that the Federal Power Commission (FPC) shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction, except as specifically provided, over facilities used for the generation of electric energy or used in local distribution, or for the transmission of energy in intrastate commerce. "Sale of electric energy wholesale," when used in said Part II, means a sale of electric energy to any person for resale, and "public-utility," when used in Part II or Part III of Title II, means any person (including a corporation) who owns or operates facilities subject to the jurisdiction of FPC under Part II.

Title II does not provide for registration by companies subject to its provisions. The regulation is effected by (1) requiring that the FPC's *approval* be obtained before the company can do certain acts and (2) authorizing FPC to issue rules, regulations or orders, and directing companies or persons subject to the Title to conform thereto.

Except in a few cases where specific sections are made applicable at a later date, most of the provisions of Title II became effective as soon as the Act was approved on August 26, 1935.

I. *Effective on August 26, 1935, and thereafter,* all public-utilities subject to Part II of Title II must obtain the approval of FPC before they do any of the following:

(1). Dispose of or lease facilities subject to the jurisdiction of FPC of a value in excess of $50,000, or merge or consolidate any such facilities with those of other persons, or purchase or acquire securities of any other public-utility [Sec. 203].

(2). Make any change in rate schedules for services subject to FPC jurisdiction, which theretofore shall have been filed with FPC as required by rules or regulations prescribed by FPC [Sec. 205].

II. *After February 26, 1936,* all public-utilties subject to Part II must obtain the approval of FPC before they can do any of the following:

(1). Transmit energy outside of the United States [Sec. 202(e)]. This subsection by its terms applies to any person.

(2). Issue securities or assume liabilities or obligations by guaranteeing or endorsing securities of any other person [Sec. 204]. The approval of FPC is not required under this section if a public utility is organized *and* operating in a State which regulates its security issues through a State Commission, or for notes maturing not more than one year after issue and aggregating not more than 5 per cent of its outstanding securities [Sec. 204(e) and (f)].

(3). Any officer or director of a public-utility subject to Part II must obtain approval of FPC before he can serve in a similar capacity with any other public-utility or with any bank or firm authorized to underwrite or participate in the marketing of public-utility securities or with a company supplying electrical equipment to such public-utility [Sec. 305(b)]. If such positions were held on August 26, 1935, application for approval of the continuance of such positions must be made on or before October 25, 1935.

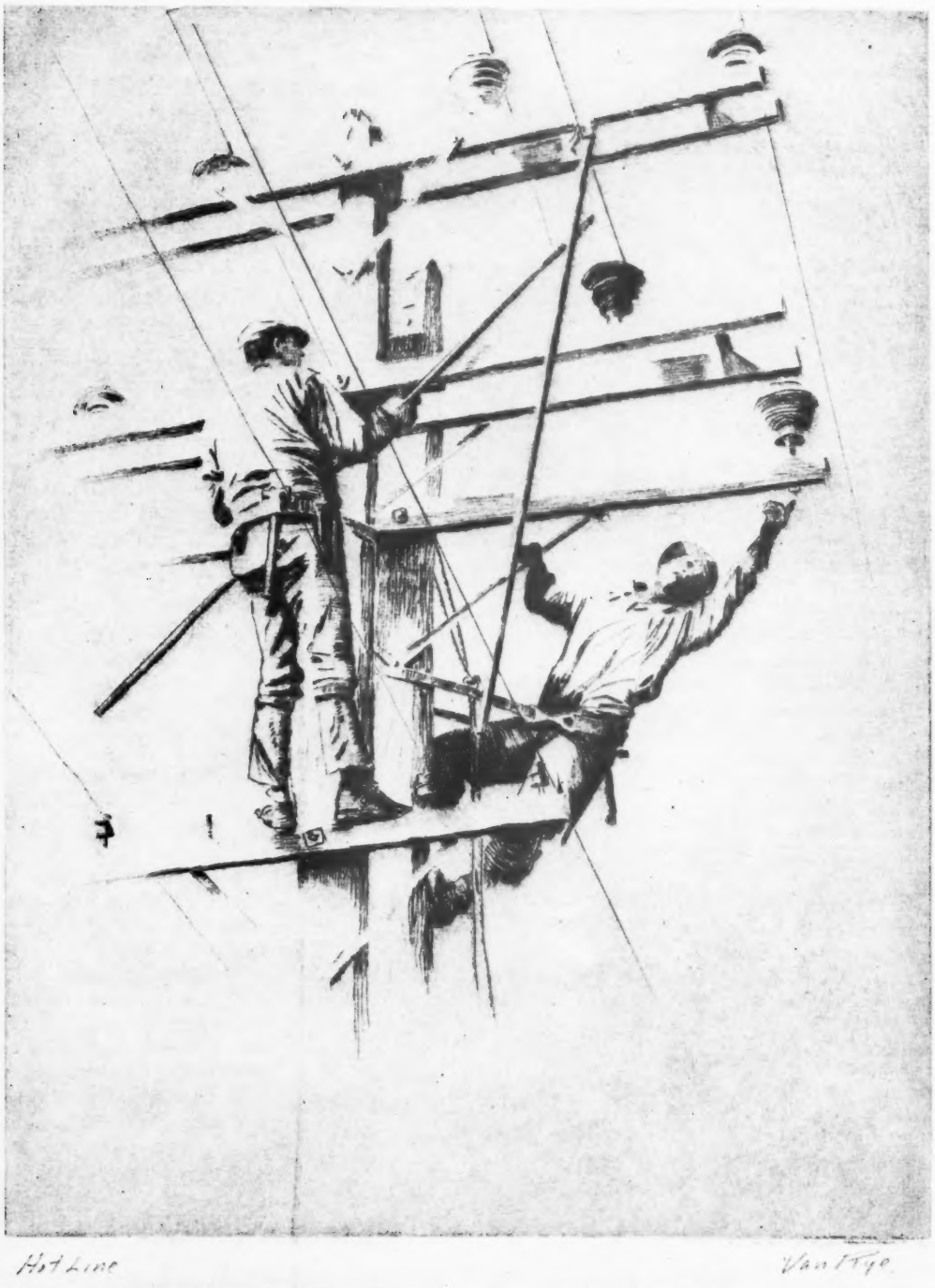
Any order of FPC with respect to the foregoing is reviewable by the United States Circuit Court of Appeals of the circuit where the public-utility is located [Sec. 313] or by the Court of Appeals for the District of Columbia [Sec. 313(b)].

III. *In addition to these regulatory powers which are operative only when a public-utility proposes to take some affirmative action, FPC is authorized, immediately upon approval of the Act* to issue orders or rules and regulations with respect to the following matters:

(1). FPC may direct a public-utility to establish physical connection of its transmission facilities with those of other persons, and sell or exchange energy with such persons, either upon application by a person engaged in the transmission or sale of electric energy or by a State Commission [Sec. 202(b)]. FPC can issue such an order only after due notice and opportunity for a hearing. FPC cannot issue such an order if it would require the public-utility to enlarge its generating capacity, would impair its ability to render adequate service to its customers or in any other respect would place an undue burden on it.

(2). FPC may, in the event of any war in which the United States is engaged, or any other emergency determined by FPC to exist, require temporary connections of facilities and "such generation, delivery, interchange, or transmission of electric energy as in its judgment will best meet the emergency and serve the public interest." If the parties affected fail to agree, FPC may

(Continued on page 355)



HOT LINE—An etching by Orie Van Rye, District Engineer, New England Power Engineering and Service Corporation, Providence, R. I., that won first prize in a recent exhibition of the Chester County Art Association, Westchester, Pa.

Self Reliance

How dull it is to pause, to make an end,
To rust unburnish'd, not to shine in use!
As tho' to breathe were life.—Tennyson

By P. S. Arkwright

President, Georgia Power Company

An Alumni Day Address at the University of Georgia, 1935; Mr. Arkwright is of the Class of 1890

REACHING the middle of my senior year at the University, I began to look around for some vocation in life. My college mates told me that if I wanted to be considered a gentleman I would have to be a professional man. Of course I wanted to be considered a gentleman.

The law course at the University then consisted of a term of nine months, with two weeks off for fall court, two weeks off for Christmas, two weeks off for spring court, two hours a day, five days a week, and then you became a full-fledged lawyer. That looked easier than qualifying as a bricklayer, so I decided to be a lawyer.

Soon after reaching this decision, the then Chancellor asked me one day what I was going to do for a living. Upon my statement that I had decided to be a lawyer, he exclaimed, "Why, you can't be a lawyer — you haven't ambition enough. You ought to be a college professor and lead the scholarly life." Being young and unhampered by experience, I naturally thought I knew more than he did, so I disregarded his advice.

Not So Good as a Professor

Dr. Boggs wasn't wholly satisfied, so he awarded me a fellowship in modern languages, in order that I could try my hand at assisting the professor in teaching French and German at the same time I studied law. Evidently I didn't do so well as a college professor, because the University wouldn't pay me. (They finally did do it twenty years afterwards.) But the failure to get paid at the time made me think that maybe I would do better as a lawyer than as a college professor.

In a few years I found out he was right about my fitness for the law, and I left it and went into business. In business, I found out that the advice of my college mates was right, that

MR. ARKWRIGHT

business men are not considered gentlemen. And in the last few years I have found out that the college professors called by the Federal Government to regulate business do not believe in ambition or individual enterprise for the hope of profit, but rather in collectivism or some form of state socialism. I think they now call it State Capitalism.

Historians in the past have not seen fit to accord to business its proper part in the rise of civilization. Their conception of history has been that it consists of exceptional matters, of celebrated or notorious events, of the lives and actions of great political leaders, whether good or evil, of conspicuous achievements in war, politics, explorations, science, art, religion, and literature.

The student of history in the future will gather his facts as to the service of business in 1933, 1934 and 1935 largely from newspaper files, from the reports of the Federal Trade Commission, from records of prosecutions of violations of the National Industrial Recovery Act, from innumerable investigating committees and from the Congressional Record. On such a record alone, posterity's conclusion cannot be otherwise than that business enterprises in 1933, 1934 and 1935 were conducted by thieves, robbers and racketeers, actuated only by greed and lust for power.

Business Serves All

Business existed before art, or literature, or education. It coordinates and makes serviceable to mankind the thoughts and talents and labor of men. It furnishes the incentive for endeavor and supplies the stimulus for invention and discovery. It gives practical application to ideas. It organizes, systematizes, manages and directs all human effort. It develops the natural resources, opens the mines, refines the raw products, manufactures the materials and conducts the services of exchange, transportation, and distribution. It gathers and disseminates the information. It provides the means for intercourse between peoples the world around. It builds the roads and the railroads, the ships, the vehicles, and the aircraft. It founds the cities. It supplies the food, shelter, clothing, materials, machinery, vehicles, tools, implements, appliances, comforts, conveniences, luxuries, and amusements. It is the work-creator and payroll-supplier. Wherever we live, whatever we need, no matter where grown or produced, business brings it to our door. Civilization has ever followed the trail of commerce and trade *and business leads the way*.

There have been many attempts in the past to make experiments in applied socialism. Many such experiments have been made in America and every single one of them proved a failure. Not one

of them gave any concrete accomplishment to civilization. They left not a single invention, tool of trade, work of art, or scientific discovery.

One such society was formed in the early history of Massachusetts. The Governor of Massachusetts in those early days, in referring to this socialistic community, explained its failure by calling attention to the fact that the Lord had implanted in man certain appetites, instincts, and aspirations, all for a purpose, and that among those he gave him a desire for individual reward.

He said that this was for the purpose of inducing him to develop the resources, build the industries, create the works of art, make discoveries, invent tools and appliances, and make of him an individual creator and, through the results of these individual efforts, a helper of his kind and a builder up of civilization.

"Wiser Than God"

He said that the socialistic idea proceeds on the basis of taking away all hope of individual reward, thus removing all incentive to effort. He referred to the people who promote the socialistic policy acting "AS IF THEY WERE WISER THAN GOD."

Without the activities of business, there can be no progress, no prosperity, and the activating force of business is the hope of reward. There is no wealth without work, and there is no productive work unless someone creates. Business and the business man serve society by creating work.

It is this creative impulse which concerns us most. It exists only in individuals, never in committees or groups or governments. It does not exist in all individuals, and it can be suppressed and destroyed in those who are born with it. It can never be created by compulsion. Its mainspring is the hope of reward, and it is most quickly destroyed by denial of the reward that is justly due.

The reward sought after may take any one of many different forms, but there must be reward. Without it, without the hope of gaining it, there is no striving, no achieving, no creating. All good and all evil are done by individuals, and whatever individuals may do is actuated by some expectation of individual advantage and advancement, of reward in some form, whether it may be money, power, personal security, popular acclaim, the affection of a loved one, or the satisfaction of a job well done.

This being a fundamental characteristic of human nature, and this ability to achieve residing only in individuals, it follows inevitably that the most progressive and the most prosperous nations are those having the largest number of individual citizens who strive, who seek to achieve, who create work for themselves, and for others, in the hope of gaining the rewards.

In addition to this creative impulse actively at work in a large number of individuals, there must also be one other thing in any successful social system—productive capital. And again we find that the impulse to profit creates it. Enterprise, thrift and self-denial, work hand in hand in creating and accumulating whatever capital there is. Someone works, someone saves, someone does without, someone does not spend all he makes in the hope that there will be more later. By the operation of simple mathematical laws, his self-denial aids in storing up the capital which is essential to the progress of society.

Socialism Kills Enterprise

The socialistic theory works contrary to these two basic facts in human nature and human affairs. Collectivist in principle, it suppresses the individual and elevates the state. In the name of the state, it takes possession of private capital, and thereby it discourages or prevents the private citizen from creating and accumulating capital. It puts the label of greed upon all striving for individual reward, declares it ignoble, places obstacles in its way, and thereby kills the incentive for striving. It denies the rewards, and immediately it takes away that which calls for creative impulse into being.

Hope of reward is not ignoble. It is the compelling force driving individuals to the performance of service. Service must pay for itself or service ceases. In the operation of business, this compels the effort to extend the benefits of the service as widely as possible. It forces economy and efficiency, in order that the price may meet the ability of the consumer to buy. Business not only makes the profit but business conserves the profit. It accumulates the wealth. Wealth serves all mankind, no matter in whose hands the accumulated wealth may be. It raises the general standard of living. It makes possible further productive enterprise. It increases the prosperity, the comfort, and the happiness of all people. It sustains government, art, literature, science, and education. The making and saving of profit is, therefore, not only the motive which actuates business effort, but is in reality a part of the service rendered by business.

"A Self Helping Race"

Not only was America discovered and settled under the principle of free play for individual initiative, but because of it and as a result of it, America has attained its marvelous development and prosperity.

Woodrow Wilson, in his History of The American People, stated:

"When the new century (the seventeenth) opened, France and England alone stood ready to compete for North America. And, for all France was as keen to seek her interest in the New World as in the Old, the signal advantage, as the event abundantly proved, was to lie with England in this new rivalry in the wilderness. The reason is now plain enough. England had obtained from the sixteenth century just the training she needed for winning America in the seventeenth, while France had unfitted herself for the race by the new life she had learned.

"England had become a commercial nation, quickened in every seaport by a bold spirit of individual enterprise that would dare anything for a success. . . . In France, meanwhile, individual initiative had been stamped out and the authority of church and state consolidated, to command and control every undertaking.

"The French colonies pined under careful official nursing; the English colonies throve under 'a wise and salutary neglect.' A churchly and official race could not win America. The task called for hard-headed business sense, patient, practical sagacity, and men free to follow their own interests by their own means. . . . It was this self helping race of Englishmen that matched their wits against French official schemes in America."

In that phrase, "a bold spirit of individual enterprise," is written the history of the United States from those days of the first colonies on down to today.

It was "a self helping race" which not only won America for the English-speaking people, but pressed onward to spread the national domain out from the little fringe of settlements along the coast until it reached the opposite coast,

multiplied the wealth of all the intervening area, and achieved the highest standard of living of any nation in the world's history.

Self Reliance the Keynote

This was no ordinary achievement, and it was not achieved by ordinary people. It took boldness, daring, individual enterprise, self help, self reliance, the like of which no other nation has ever displayed. Self reliance is the keynote of the American character.

The worst sin which the socialistic theory commits against any people is the sin which it is now committing against the American people. *It destroys self reliance.* It teaches the people to rely upon government, not upon self. It gives the government such extensive powers over the daily affairs of the individual citizen that there is no encouragement, no opportunity even, for the exercise of individual enterprise, out of which exercise comes the strengthening and toughening of human fibres to withstand the storms of life, out of which comes *character.*

Idealistically, the theory of socialism says that all should strive for the common good, not for individual gain. That is the ideal, but in practice it works out just the other way. It breaks down character, instead of elevating it, because it destroys reliance upon self. The young American colonies would never have conquered the wilderness, if they and their leaders had been dominated by the schools of thought which now hold sway.

Instead, they rejected and thrust aside all such ideas. They had come to America to escape oppression by government, and they were determined to have none of it in their new world. They were proud of their individual liberties, and they erected barriers to prevent government from ever infringing upon their personal rights. They assigned to government specific and definite jobs, chiefly those of maintaining order, protecting life and property and providing for the national defense. *All the rest they kept within their own hands.*

A Government of Restricted Powers

They were free men, and they drew a sharp line between the rights which they retained to themselves and the powers which they saw fit to delegate to government. They not only asked nothing from government, beyond the performance of the simple duties assigned to it, but they knew that no individual could afford to accept aid or special favors from the government. They knew that any citizen who accepted favors from the government would have to pay for them by submitting himself to government control and thereby surrendering part of his liberty.

They did not believe that the government should support the people, and they believed, even more strongly, that the people should not accept aid from the government. Their liberty of individual action meant too much to them to barter it away in any such transactions. They wanted to be beholden to no man and no government, because they knew that government given an inch, takes an ell. They did not want the government meddling in their affairs any more than could be avoided. Self reliant, they considered themselves thoroughly competent to manage their own affairs, without interference by government or aid from government. They accepted the responsibility for working out their own destinies, willing to take the risk of loss, in the hope of gaining the rewards which their own industry, intelligence and thrift might win.

They Built Well

In this spirit, they sat down and wrote the Constitution of the United States, as a charter of their liberties and as a safeguard against encroachments by government. They believed that what they had written would endure always to preserve for their children, and their children's children, the same rights of individual action, the same opportunities for personal advancement, which they themselves enjoyed. What they then erected did endure without any substantial change until comparatively recent years. The history of the American nation, its rapid advancement, its outstanding achievements, is proof that they built well.

Never in the history of the world did any other country make such rapid progress as this nation has made in the short 150 years of its life. We have no predecessor in past history and we are, or have been, the admiration and envy of the modern world. It has all been due to the fact that this country provided the greatest possible measure of individual freedom and individual opportunity. It gave encouragement to individual enterprise. It developed men with stout hearts, with courage, with daring, with self reliance; men who didn't give up when they encountered obstacles, but pushed on boldly and bravely to conquer the forests, open the mines, build the railroads, span the rivers, build the electric lines, the radio, the automobile, the telegraph, the telephone, the airplanes.

The United States developed men of that kind because it gave them opportunity and the hope that they might expect to enjoy the fruits of their toil.

A Plan that Works

The idea that government might ever engage in business was foreign to all the beliefs of the founders of this country, and the possibility that government might ever compete with private citizens in the conduct of private business was repugnant to every ideal and principle they had. Our forefathers were suspicious of government. They devised every safeguard they could think of to keep government from ever extending its power beyond the field they limited for it. They erected barriers in the Constitution to prevent government from ever placing the deadening hand of bureaucracy upon the initiative and enterprise and energy and self reliance of the private citizen. They were determined that government must never be permitted to become a menace to the honest citizen conducting an honest business in an honest way, and they founded a nation upon this plan. *It was a good plan. It has worked. It has obtained most wonderful results.*

The United States has only 6 per cent of the land area in the world and only 7 per cent of the world's population. Yet our country has 32 per cent of the world's railroads; 58 per cent of its telephone and telegraph facilities; 36 per cent of its developed water powers; 76 per cent of its automobiles; 33 per cent of its radio broadcasting stations, and more than 44 per cent of its radio receiving sets.

In the United States we produced 60 per cent of the world's oil; 48 per cent of the copper; 43 per cent of the pig iron; 47 per cent of the steel; 58 per cent of the corn; and, prior to the coming of the AAA, 56 per cent of the cotton.

As compared with the most advanced countries in Europe, we have twice the number of home owners per thousand of population, we consume four times as much electricity and we have seven times as many automobiles per thousand of population.

With only 7 per cent of the world's population, the people of this country

have achieved a standard of living so much higher than other countries that we consume half of the world's coffee, half of its rubber, one-fourth of its sugar, three-fourths of its silk, one-third of its coal, and two-thirds of its petroleum.

The possession and enjoyment of these material things, however, is not the only measure of the success of the American method and the American idea of government.

In 1933, a depression year, there was spent in the United States more than $3,000,000,000 for education, and that was more than the amount expended for education by all of the other countries of the world. For the school year 1931-1932, 30,000,000 children were enrolled in public and private schools in the United States, out of 32,000,000 children of school age.

This country has more than $7,000,000,000 invested in public and private schools and nearly $4,000,000,000 invested in colleges and universities. It has nearly $4,000,000,000 invested in churches.

Like Rich Men's Children

The tragic thing is that, as a people, we have so little understanding of how this richness and fullness of life have been achieved. Even while we are benefiting abundantly from the operation of our American system of individual enterprise, we hear that system condemned and we witness efforts to substitute alien systems in its place.

We are told on every side that our only salvation is the adoption of new philosophies. And everyone of the new philosophies strikes at the very heart of the philosophy which built this nation. Everyone of them elevates and magnifies the power of government at a sacrifice of the rights of the individual. Everyone of them seeks to substitute government enterprise for individual enterprise. Everyone of them expands and extends the authority of government over the personal and private affairs of the citizens, and everyone of them restricts and impairs the liberties and the opportunities of the individual. *We are told that collectivism is our only hope and that individualism must go.*

We act like the rich man's children who throw away his wealth, because they never learned how hard it is to make money, because they think that money grows on trees. Our national wealth and our high standard of living did not just happen by accident. They did not grow on trees, and we are in danger of losing them both, unless we can quickly regain some understanding and appreciation of the forces which created them.

In this period of depression, so much is being thoughtlessly said about what America has not that we are prone to lose sight of that which she has. So much emphasis has been placed on unemployment that the far greater millions of employed are being placed in jeopardy by extravagant schemes and destructive legislative panaceas.

One of the fallacies most often repeated and widely spread is that "2 per cent of our population own 80 per cent of the national wealth and take 80 per cent of the national income." That is not true.

To begin with, it should be remembered that 60 per cent of the population are children and other dependents with no recorded income. The truth is that, of those who do share the national income, 60 per cent, not 2 per cent, receive approximately 80 per cent of the total income.

In 1932, there were more than 44 million savings deposits in banks in various parts of the United States, almost all by different individuals, with aggregate deposits exceeding 24 billion dollars.

There were 1,545,000 postal savings deposits, with total deposits of $1,185,000,000. In the same year there were ten million members of building and loan associations with assets approximating 8 billion dollars.

At the beginning of 1932 there were about 34 million ordinary life insurance policies in force, for a face amount of over 90 billion dollars, and 88 million industrial policies for a face amount of over 18 billion dollars.

In 1930 the number of owned homes was over 14 million, or close to 50 per cent of all the homes. Of the owned homes, exclusive of farm homes, almost 5 million were valued in excess of $5,000 each. Of the rented nonfarm homes, 2,102,000 were rented at more than $50 per month. In 1930 the average net value per farm, after deducting all indebtedness, was $7,500. And of all farms three and a half million were actually operated by the owners.

As of a recent date there was an automobile for four out of every five families in the United States. Two-thirds of all families in the United States had electric service and 40 per cent of all families had radios.

Another oft repeated fallacy is that "the workers' share of the national income has been steadily decreasing." This, too, is untrue. The workers' share in the national income moved from 38 per cent in 1850 to 65 per cent in 1929. In1931 and 1932, it equalled 75 per cent to 80 per cent of the income actually produced and was even more in the case of manufacturing and related industries, which paid the workers out of capital or borrowings two and a half billion dollars in excess of the *total* receipts of these businesses.

Workers' Share Increasing

Another oft repeated fallacy is "that corporation profits increase faster than workers' wages." This is likewise untrue. Corporate profits between 1922 and 1929 averaged around 4 per cent of their gross income. From 1880 to 1929, the increase in the share of the national income paid to employes was greater than the increase of employes, both in numbers and as a percentage of our population.

In the past 90 years, business has absorbed 43 millions of our population in productive employment, increased the number of employed in the manufacturing industry nearly 17 times, reduced the average hours of weekly work from 66 to 48 and increased the purchasing power of each hour of work in terms of commodities more than four and one-half times.

There is also widespread misunderstanding of the situation with regard to child labor. Great applause was given the NRA for having taken out of employment 70,000 children under 16 years of age who were working in factories in 1930.

But the twenty years before NRA, before 1930, witnessed a far greater achievement. More than a million children were taken out of employment during that period. This was not an achievement of government, of social workers, of socially-minded exponents of new doctrines and new philosophies. It was an achievement of business, the American system of business, which decreased child labor in the only sure and lasting way—not by codes, not by governmental edicts, but by raising the standard of living.

And the American system of business did even more for these children which it had saved from child labor. It gave them an education. It paid the taxes which supported the schools and col-

leges in which these children were obtaining education. During the twenty years before the NRA was conceived, the number of children who were able to remain in school until they had completed high school and college courses was steadily and rapidly increasing.

In the entire world, the American workman and his children have the highest standard of living, and the greatest opportunity for education and advancement. They are the envy of the workers in every other country.

Yes, the American way of doing things is a good way. America's achievements prove it. Business, operating under the American plan of private initiative, individual enterprise and self-reliance, created the wealth which has made these things possible. It created the work and paid the wages which have permitted the entire public to enjoy the highest standard of living of any nation in the world's history. It has sustained the government, built the churches, built the schools and the colleges, paid the preachers and the teachers, supported the professions and the arts and the sciences and made the United States the most fortunate of all nations.

The Evils of Business

Of course, there are evils in business. Naturally the desire for profit or reward leads to greed, dishonesty, chicanery, oppression. These are not faults of the system; they are faults of men. They exist among all men in all lines of endeavor. As a class, it can be safely asserted that business men are, if anything, characterized by a greater degree of honesty. In addition to the moral principles of business men, which are certainly as high as the average, honesty in business has for them a distinct commercial value. But because there are dishonest practices in business, there is no need to abolish the entire system. The fact that the hope of reward leads sometimes to excesses provides no valid reason for destroying the incentive to progress that is inherent in the hope of reward.

It is an instinct implanted in man for a purpose, just like all the other instincts. Appetite was given to man to induce him to eat the food that is necessary to sustain life. Appetite is often grossly abused, but is that any reason for destroying appetite? The sex instinct was given for the purpose of reproducing the race. It is frequently abused, but destroy it and you destroy its objective.

So it is, if we destroy the incentive that exists in the hope of reward. Destroy it, and you destroy the objective, which is to induce individuals to develop the resources, build the industries, make the discoveries, invent the tools and appliances, and through the results of their individual efforts to become helpers of mankind.

Operation of business by government does not remove improper practices; it increases them. Whatever the abuses in individually conducted businesses may be, the incompetency, waste, extravagance, and graft so often found in the conduct of industry by government overshadow them.

But this simple fact, known to everyone, that individuals, whether in government jobs or in private life, sometimes make mistakes, abuse their rights and commit sins, is a trivial matter by comparison with the serious issue which confronts us all today.

Whether we like it or not, the past two years have witnessed a profound change in our governmental institutions and in the relationship between the individual citizens and the government.

The safeguards of individual freedom written into the Constitution have been nullified by the device of declaring the existence of an emergency, and then perpetuating that officially decreed emergency so long as it is useful as an excuse for governmental actions not sanctioned by the Constitution. The conception of this nation as a federation of 48 sovereign states, retaining to themselves all powers except those expressly delegated to the federal government, has been broken down by an enormous expansion in the powers of the central government.

America Transformed

The states and municipalities, instead of resisting this change, have aided in it. Tbey have not only accepted, but have sought, grants of money from the federal government, and in pay for this money, they have surrendered many of their rights of self government, acquiescing in regulation and control of their activities by federal bureaus.

Federal bureaucracy has grown greater in size and in the multiplicity of its powers than ever before in American history. Already it regulates wages, hours of work, dealings between employer and employe, the crops the farmer may plant and may not plant, and many others—and each day it reaches for more and more powers.

Private initiative and private capitalism are more and more restricted, while State Capitalism grows larger and larger, as the government takes possession of a larger and larger share of the national income and extends wider and wider its activities in the field of business.

Decay of Self Reliance

The cause of it, in my opinion, is a decay of the spirit of self reliance in a large number of the people of this country. And that, in turn, was produced, in my opinion, by two things.

The first of these is a widespread misunderstanding of the elementary principles of our American economic system. The second is the teaching and the widespread popular acceptance of economic doctrines which encourage dependence upon the government rather than dependence upon self—doctrines which are basically antagonistic to the American system and which destroy self reliance, instead of encouraging its development and growth. The first a negative factor, the second a positive factor, have worked together to bring about the overthrow of essential American institutions which have stood for 150 years.

Must we continue stupidly unaware of the simple principles upon which our past successes have been built and upon which our future successes will depend? Must we continue blind to the causes of our present difficulties until it is too late?

Can't we learn the simple axiomatic fact that nothing, for good or for evil, is done except by individuals? Can't we learn that the welfare of the nation, any nation, is best served when it has the best individual citizens and the largest number of best individual citizens? Don't we know from our own personal experience that the best individual citizens are men and women who stand on their own feet, who have a sense of responsibility, who don't wait for some one else to tell them what to do but have some initiative of their own, who keep pressing onward in spite of hardships, who don't quit, who know what to do when emergencies come and do it? Can't we learn that these self reliant qualities are developed by the American system as it has been in the past? And that they are destroyed by the American system as it is now coming to be?

Remember that our American capitalistic system is not a profit system. It

is a profit and loss system. It is a hope of profit system.

Not all persons profit, but so long as there is hope, all keep pressing forward, seeking to win the rewards. Not all businesses succeed. More fail than succeed. The average life of businesses is about ten years. It is the exceptional business which lives to see its twenty-fifth or its fiftieth birthday. Risks are the everyday life of business, but so long as there is hope of reward, there is incentive for taking the risks.

This pressing onward, in spite of risks, in spite of hardships and dangers, is what enables business to perform its function as the work-creator and the payroll-supplier. And under our profit and loss system, the general welfare is served, the general wealth is increased, whether the individual business loses or wins.

Whatever wealth business or the individual may create is constantly being distributed back to the public. "Three generations from shirt sleeves to shirt sleeves," says the old proverb. One generation creates new wealth by its energy and accumulates it by its thrift. The next generation scatters it by lavish spending. And the third takes up the job again of building back. The wealth of the community has been increased, both by the generation which made the wealth and by the generation which scattered it.

All Share the Wealth

So it is with business. Wealth is constantly being accumulated and constantly dissipated under this profit and loss system. Payrolls spread the accumulations of wealth, obsolescence eats up capital goods and requires them to be replaced, new inventions require whole factories to be torn down and new ones built, and failures take all the wealth accumulated by the business that fails and scatter it far and wide.

The individual or the business may lose, but the wealth of the community steadily increases, the standard of living steadily rises, so long as this interplay of profit and loss factors continues at an accelerated pace under the incentive of the hope of profit.

Remove that hope, and the whole process slows down. Fewer people take risks, there is less striving, less new wealth is created, obsolescence and wear and tear continue to eat up capital goods, but there is less replacement of the old by new. Failures continue to occur, but fewer young men, with high hopes in their hearts, launch out in businesses of their own to fill up the gaps caused by the failures.

Remove hope, and you have removed the mainspring. The incentive is gone. The whole process slows down, and eventually the standard of living sinks down to a lower and lower level.

But Wealth Must Be Made

That is what is happening in the United States today. The mainspring has been weakened. It isn't gone, but it has been weakened. The incentive has been taken away. It isn't because profits have been taken away—that's the natural thing in a period of depression. It's because the *hope* of profit, future profits, has been removed from the minds of many of our best and most valuable citizens, who otherwise would be taking the risks, creating work, creating payrolls, doing the jobs that would pull this country out of the depression.

Can't we learn something from the fact that the present depression drags on and on? We have had depressions before, and we came out of them in comparatively short periods of time. We did it in previous depressions, because business and business men pulled themselves out of the hole, and they pulled the rest of the country out with them.

This time, business is not being permitted to perform that service for the nation. Business and business men are being thwarted and checked at every turn by the new theory and the new philosophy which now hold sway. Business is subjected to unduly repressive restriction and regulation by government. It is intimidated by threats of government competition. Its resources are taken away by excessive taxation. Resources which businesses might now be using to provide work for the unemployed are taken over by the government on the theory that government, not business, should be the work-creator and the payroll-supplier.

Under such circumstances, it would be difficult enough for business to end this depression in the same manner that it has ended previous ones, but I know personally that there are plenty of business men who would dare even these risks, tackle even these difficulties and press forward even in spite of these obstacles which government has placed in their path, if it were not for the deadening effect of the one additional element in our present national situation—fear.

Every business man I know distrusts the federal government. As a deterrent to enterprising, the present difficulties are nothing compared with the fear that government intends to expand itself still further. The one competitor private business cannot cope with is the government itself. Fear of competition by government, where such competition does not already exist, fear of government confiscation, directly or by exorbitant taxation, is what is holding business back, and it is what is holding the country back. The whole activity of business has been slowed down, not because profits are low, but because hope of future profit is low, and the depression drags on and on.

At the Crossroads

As individuals and as a nation, we are at the crossroads. Either the government will withdraw from the field of business and return to the policy of encouraging the initiative of the individual, or the government will continue to expand and will take over more and more of the activities that have been traditionally the prerogatives of private citizens and of private business, until the United States has ceased to be a democracy and become some type of collectivist state.

As matters now stand, we are half individualist and half collectivist, and the conflict between these two diametrically opposed theories is producing, and can produce, nothing but confusion—a confusion of cross purposes which causes the country to halt and stumble along, and back and fill, and veer from one side to the other. Neither the individualistic plan nor the collectivist plan can function at its best while this confusion and conflict continue, and it is inevitable that one or the other must eventually win out and take possession of the field.

The Price of Security

In making your choice between the two plans, please be sure that you understand the real issues that are involved in this crucial situation.

We can exist under a collectivist plan. The United States, in my opinion, is not going to collapse, cease to exist, disappear from the face of the earth, even if we do become some type of collectivist state. We can exist under it. The question is what kind of existence it would be—whether it would be living or just existing.

What may we expect if collectivism becomes dominant? You can find the

key to that riddle in the great prominence that is given these days to the idea of *security*—security for the individual against the hazards and risks of life, security against old age, security against unemployment, security against sickness and accident, security against risks of competition for the business man under the NRA, security against crop surpluses for the farmer under the AAA, security against this, that and the other thing—*and all of this security to be achieved, not by the enterprise and energy and thrift of the individual, but by the passing of laws, by codes, by regulation, by government.*

I am not decrying security. All of us desire it, especially as we grow older. No self-respecting person wants to see his parents in the poor house. Certainly none of us want to end up there ourselves. Every foresighted person wants to have something laid by for a rainy day. *Security versus lack of security is not the issue.*

The issue is whether the responsibility for the individual citizen's security shall be assumed by the government or by the individual citizen himself.

If the government is to take over that responsibility, then we must, as citizens, accept the penalties and sacrifices which such a system requires. If that is to be the government's job, instead of my job and your job, then each of us necessarily becomes a dependent of the governmnt. Each of us bcomes, in greater or less degree, a ward of the government, and we must accept the position of inferiority that is the lot of wards.

Theories Don't Change Facts

We cannot be dependent and independent at the same time. If the government is to have that responsibility, then the government must also have the authority to manage the personal affairs of the citizens. Without that authority definitely placed in the hands of the government and firmly exercised by the government, no collectivist system can function.

Security obtained through government is always at a sacrifice of personal liberty.

The further question, and the most important one, is this: If the collectivist plan should gain security for us, as a nation and as individuals, what kind of security would it be? If we pay the price, if we give up our individual freedom for the sake of the general welfare, as the collectivist plan requires us to do, will we benefit by it? The answer is simple and clear.

We cannot escape from first principles. We cannot get away from the fact that our present high standard of living, even in this depression period, has been achieved by independent people, not by dependents; by reliance upon self, not by reliance upon government; by private enterprise, not by government enterprise; by individual responsibility, not by social responsibility or government responsibility; by a system which encourages boldness, daring, hardihood, willingness, to take a risk, determination to win through to the goal, not by a system which discourages individual enterprising, undermines self reliance, punishes thrift, weakens character and entices an entire nation into a position of dependency upon government.

We cannot escape the fact that wealth is made only by work, accumulated only by thrift, and made and saved only by individuals actuated by the hope of reward. We cannot escape the fact that the high standard of living of the American people, and the social benefits enjoyed so widely by the American people, have been made possible solely by the rapid creating of wealth, stimulated by the American system of freedom for the individual and encouragement of individual enterprise. We cannot escape the fact that the billions, now being spent by the government in various social welfare plans, are being drawn entirely from the workings of that same American capitalistic plan. *And we cannot escape the fact that if we destroy the plan, we will destroy also its benefits.*

No other plan has worked so well in the world's history in giving an entire people a high standard of living, and if we abandon the plan, we must lose also the high standard of living. We must expect fewer social benefits, not more.

But, if security is all we want, perhaps the collectivist plan might provide it, after a fashion. If we are willing to accept a lower standard of living, in order to gain security of a sort, perhaps the collectivist plan is what we want.

Is security all we want? Have we become a nation of old people, interested only in safety for our declining years? Has life lost its interest for us? Are there no more risks to be taken, no more rewards to be won? Are we too fearful of the risks to strive for the rewards? Is existing all we want, not living?

We were not born just to live until we die! We were born to be of some use in this world, to achieve something, to accomplish something, to do some good for ourselves and for our fellow man. We were not born just to be safe, and nothing else, to be guided by a careful hand from the cradle to the grave, never to know the thrill of taking a chance, never to know the joy of winning the prize.

Opportunity is what we want, not security! What a dull world it would be if security, bought and paid for by surrendering opportunity, was all that we had!

If the world is finished, if there are no more rewards to be won, if there is no more wealth to be created, if there is nothing to be done but divide up the wealth that already exists, if there is no further need or use for the creative impulse, if we have become a nation of old people in our short 150 years, if the fire has gone out of us—then the collectivist plan is what we want.

But, if there is any youth left in us, if there are any more inventions to be made, if there is any more progress to be achieved, if there are any more rewards to be gained—*give back to us, as free born Americans, our opportunities and we will build here a finer world than the world has ever seen!*

Georgia Stands for the Right

As Georgians and as sons of the University of Georgia, we have every reason to stand for the right and against the wrong in this critical period of national affairs. Georgia has held more closely than any other State to the American tradition of personal liberty and individual enterprise, and the University of Georgia has furnished the leaders who have written this principle into our State policy.

Look yonder at the portrait of Robert Toombs, a son of this University of Georgia. You know the story how he said when the Constitution of 1877 had been written that he had "locked the door of the treasury and thrown the key away." He had written into the Constitution of the State provisions which would forever restrict the State government and the municipal and county governments from extravagance and from incurring debts which they could not pay. But he had done an even more important thing. He had written into the Constitution of Georgia the principle and policy that Georgia intended to encourage private initiative, individual enterprise, self reliance. By restrict-

ing the power of government to go into debt, he had written into the Constitution a prohibition against the theory of government ownership and operation of business in competition with the private citizen.

Robert Toombs and the distinguished members of that constitutional convention knew that encouragement of private initiative was the best policy for the welfare of the State and the people. They would have abhorred the efforts which are being made today, at the instigation of the Washington government, to break down or get around Georgia's restrictions on the incurring of government debt which are written into our Constitution.

And before that Constitution of 1877 was written, Georgia was following the same policies. At only one period in the State's entire history has Georgia been guilty of extravagance in government expenditures, and that was when the carpetbaggers were in control.

Of course, there have been many efforts to entice Georgia away from its traditional policies, but always they have been repulsed. You can remember what happened a few years ago when all the States around us were getting out bond issues of millions of dollars to build highways, and a powerful effort was made to get Georgia to do the same. The battle raged for three or four years, and every possible argument was used. They told us how many jobs would be created by the big bond issue, how many people it would put to work, how it would stimulate business all over the State, and how many social benefits it would bring to all the people—they didn't call them "socal benefits" in those days, but they used the same line of argument that is used today.

Fortunately, there were some hard-headed folks in Georgia in those days. They knew that big government debts are mighty uncomfortable things to have, no matter how many fine highways you may have. They knew that dumping several million dollars into the laps of the State officials, all at once, would be likely to encourage extravagance and the spending of money on unsound and uneconomic plans.

And the traditional Georgia sentiment won out in that fight, as it has always won out. The pay-as-you-go crowd defeated the bond issue crowd, and John Holder, who sits down there among you in this audience, and Major John S. Cohen, of the Atlanta Journal, were among the leaders of the men who held Georgia in line. Now, we have highways that are just as good as the highways of any of our neighbor states, but we don't have the enormous State debts that they have. They got highways and debts; we got highways.

Georgia Resists Clamor

It has happened time and again in Georgia's history that when efforts were made to turn Georgia away from the traditional American plan, the Georgia plan, there have always risen up leaders with the stubbornness to resist popular clamor, and Georgia has remained true.

What would Robert Toombs do if he were confronted with some of the problems which confront this nation today? There was a depression back in the period when he was just beginning his public career. In 1842, when he was a member of the Legislature, a "stay bill" was introduced. It was something very much like the mortgage moratorium bills which were passed last year by the Congress in Washington. The "stay bill" was given a favorable committee report, but Toombs wrote a minority report and it defeated the bill. In it, he said:

"The great principles of political equality, of truth and eternal justice are as much violated by robbing the few for the benefit of the many as by plundering the many for the benefit of the few. A good and just government will do neither. An honest people will oppose both."

And Phillips, in his life of Toombs, says: "Toombs in defeating the proposal was following in the path which William H. Crawford had blazed in Georgia nearly 40 years before."

Georgia has always been like that. It has always stood for individual rights, for the opportunity of the individual to work out his own destiny unhampered by too much government, for a government of law as opposed to a government of men.

Georgia has always believed that the government should be conservative, because it knows that, when government is conservative, there is the greatest amount of freedom for the individual. It has restricted and held government into its proper sphere of action, so that government might not intrude upon the individual citizen's sphere of action. It has known that personal freedom is put into danger whenever the government is permitted to increase its powers. It has maintained this principle as a basic policy in State affairs, and it has repeatedly resisted efforts by the federal government to break down this Georgia idea and to trespass upon the rights of the State.

Avery, in his History of Georgia, covering the period from 1850 to 1881, writes that: "The fact is that Georgia has antagonized every measure of the Federal government that has in her judgment encroached upon constitutional law or individual liberty."

Georgia has had the Wisdom to know that Justice to the individual citizen is best obtained through Moderation on the part of government. Georgia has had the wisdom to know that when the government ceases to practice moderation, when it begins to extend its activities into every field of human life, then individual liberties are destroyed.

Georgia is Self Reliant

We Georgia people are a rugged people, a hardy people. Our traditions make us that way, our environment makes us that way, our form of government has helped to keep us that way. Our soil is red and it has put red blood in our veins. Underneath the soil is granite, and it has given us strength. Our pine trees stand erect and straight, no matter how hard the winds may blow. They supply the masts of ships to withstand the storms. Our massive oaks are firm and strong and enduring through the centuries. They supply the knees for ships to resist the crush of the seas.

We Georgians stand on our own feet. We fight for what we think is right. We have a strong element of self reliance in us. We have retained our personal independence because we have retained a form of government designed to preserve independence. We have never believed that the officials we elect are so much wiser than we are that they should have the right to manage every little petty detail of our private lives.

Georgia's very nature, its traditions, its environment, its people, make us resent any theory of government which is predicated upon the idea that we are poor, weak, helpless creatures, who have to be coddled and pampered and told that we must do this and we can't do that. We are in the habit of doing things our own way. We like to have our own way about matters that affect us. We are independent, individualistic, stubborn, self reliant.

Let's keep Georgia that way. Let's hold onto our self reliance, no matter what the rest of the country may do!

Trial Installations of Electric Wiring

By Alexander Maxwell
Director of Engineering, E.E.I.

AMONG the many questions raised in connection with the body of regulations governing interior wiring for light and power, and centering around the National Electrical Code, the question of trial installations seems to have generated as much heat as any other, and to have exhibited a capacity for provoking misunderstanding considerably greater than others. Since the case for trial installations appears to its proponents as entirely innocent and straightforward, it has been deemed worthwhile to prepare a discussion of it in connection with this series of articles on Code matters.

The term "trial installations" has come to have a special meaning in wiring circles during the past few years. They may be defined as installations of interior wiring not conforming to the National Electrical Code by reason of one or more novel features and/or utilizing materials not "listed" by Underwriters' Laboratories. They are particularly identified with the Electric Light and Power Group because electric utilities have done most, indeed have done practically all that has been done, to promote improvements in the house wiring art to conform with the modern economic situation, particularly for the adequate electrical equipment of the homes of consumers with limited means.

The collision between these projects and their critics occurs in connection with a fundamentally laudable purpose upon the part of many interested parties to promote the universal application of the National Electrical Code and the various auxiliary regulations that accompany the Code. For a good many years, with increasing intensity, and on the whole with increasing success, underwriters, manufacturers and others have promoted the Code to be the single standard for interior wiring. Many of these efforts have been directed toward improving the loyalty of the inspector fraternity to the Code and in this connection it has been sedulously taught that any departure from the literal provisions of the Code was a kind of disloyalty to themselves.

The electric utilities, as a matter of fact, have contributed materially to this movement, have supported the use of the Code consistently and have urged others to do so. This support has been rendered on their part without misgiving until quite recently when the more serious aspects of Code fundamentalism have compelled them to define their position. This position is substantially that the Code is the representative guide to practice in its field, but that its current provisions at any time do not necessarily bound the limits of the art; in a few plain words, that things done within the confines of the Code provisions are certainly safe and good, but that many other things not presently contemplated by the Code may be equally safe and good. With this in view, it has appeared to electric utilities that trial installations, essentially experimental in character, are in their nature outside the purview of the Code, and a matter of concern only to those having a financial or other tangible interest in the experiment, such as the carrier of the insurance risk, the consumer himself, the manufacturer of the materials used, the promoters who may be the utility, and particularly, the local public authorities who are responsible for public safety.

It is curiously the fact that these are the same considerations that brought about the existence of the Code itself, and a trial installation might be regarded as a code in miniature where it is practicable to bring all of the individual parties at interest together. On the larger scale of the Code, dealing with those practices and materials that have passed into general commercial use over great areas, and where hundreds of carriers, thousands of local authorities and manufacturers, and millions of wired premises are involved, it is convenient or necessary to bring all of the settled practices together with due regard to the same various interests, and publish the result for general use; this is the Code.

Those who hold the opposite view, however, say that trials, that is to say experiments in the art, should be held under official auspices. It has actually been proposed on many occasions, and seriously discussed, that experiments in wiring should be submitted to committees, such as the Electrical Committee that formulates the Code, or an equivalent representative body, and, if the committee thinks well of it, an experiment may be ordered. Without going into the technical questions of representation and jurisdiction, it may be noted that such a proposal contemplates that an inventor shall submit his novelty to a jury of his competitors, who will decide whether or not it shall see the light of day.

There is, however, a more subtle defect in such proposals. Invention and development does not proceed by order and authority, but by trial and error, and of all the instruments of authority the committee is the most sterile, whatever value it may have for other purposes, such as coordination. The reasons for this are universal and are well understood in all fields of human activity. Progress and invention are natural processes and like nature are inherently wasteful as seen by the myopic eye of bureaucracy. For example, one commercially sound development from a dozen or so of experiments might be regarded as an excellent batting average.

Everybody knows this as an abstract principle, including the proponents of regulated wiring experiments, and it is therefore pertinent to seek what other and more important considerations may exist to support proposals that would otherwise be absurd upon their face. As it happens, the explanation is readily at hand, for it has been quite frankly stated by the opponents of trial installations that the object is preservation of the commercial status quo. There is, to be sure, an over-gloss of safety considerations, to the effect that such experiments might contain new or unsuspected elements of hazard, which of course is true enough, being the same kind of argument as that which would keep one indefinitely in bed to avoid the admitted and real perils of rising and walking. Practically, it is incredible that such considerations can be convincing even to those who propose them, for the reason that trial installations, by their nature, are conducted on a small scale, under controlled conditions, and of course,

with the particular object of revealing any new or unsuspected hazards.

The conclusion is almost inevitable that the only real consideration unfavorable to free experimentation is the protection of the established regime against unforeseen competition and indeed this is practically conceded, as noted above. Probably the merits of the proposal for control, in itself, are debatable in view of the faith in planned economy that is held, or professed, by many, but granting it had merit there can be no question that it would be purely a matter of commercial economics, quite unrelated to the control of electrical hazards, and completely outside the sphere of the Electrical Code. It is particularly because the Code, whose sole authority and reason for existence is for the control of hazards, is brought into the picture, that these proposals become logically and practically objectionable.

With these circumstances in view the Electric Light and Power Group effected an arrangement with the National Board of Fire Underwriters for notice and acknowledgment of intention to conduct a trial installation. This arrangement was not based upon a theory of authority in the sense of jurisdiction but was a recognition that the carriers of the insurance risk had a tangible interest in the proceeding. Thus the Fire Underwriters may agree, criticize or disagree with the proposal according to their views of the hazards involved and their effect upon the risk.

An important point in these arrangements is a stipulation that the assent of the local public authorities having jurisdiction must be procured. That is, the National Board of Fire Underwriters will not agree to, and the Electric Light and Power Group will not propose, any project except with the assent of the local authorities. This is worth noting because in certain public fulminations against trial installations, a year ago or thereabouts, it was stated as a fact that the underwriters or the utilities, or both, were attempting to override local authorities by means of this trial installation arrangement. It will be seen that this allegation had no foundation in fact.

From the foregoing it may be seen that trial installations as conducted under the auspices of the Electric Light and Power Group provide due respect for the interests of all who are really concerned with the project. When it is also taken into account that such experiments are naturally limited in numbers and scope, that they are closely supervised and because they are experiments that receive an extraordinary amount of engineering and supervisory attention, and that they are in general not applied to high value risks or hazardous situations, it is difficult to believe that any informed person could seriously regard them as a threat to the integrity of the Code, or to safety practices generally, or to the prestige and authority of inspectors.

As the matter stands, trial installations are being conducted, and no doubt others will be undertaken, covering various aspects of wiring practice, and although many of these may prove to have little or no practical commercial value, the prospects appear to be excellent for the evolution of new methods and materials that will be of real value in the service of domestic consumers and many of the smaller types of commercial occupancy.

The reference earlier in this article to the movement for establishing the National Electrical Code and its subsidiary regulations as a universal and all inclusive standard for interior wiring throughout the United States, and to a species of "fundamentalism" that had characterised the movement, deserves more extensive discussion. The effort, like most promotional efforts where much serious evangelism has been expended, has its humorous aspects, some of them perilously close to the opinions of those who disapprove of automobiles and airplanes because they are not mentioned in the Scriptures. There are also more serious aspects, conspicuously a tendency to exaggerate the incidence of electrical hazards far beyond the known facts of the case.

Nevertheless the basic idea is a worthy one and fully entitled to support within the limits of common sense and reasonable application. Unfortunately the somewhat liberal views of the Electric Light and Power Group, stated elsewhere in this article, have been denounced as heresies in some quarters; this is a great pity, for the electric utilities throughout the country could probably be as effective as any other group in promoting universal observation of the Code. They would probably do it much more enthusiastically and effectively than at present if their suggestions for the liberalization of the Code and Code practice were accepted.

October Meetings of Engineering Committees

Transmission and Distribution Committee

P. H. CHASE, Chairman

The fall meeting of the Transmission and Distribution Committee has been scheduled for Oct. 9, 10 and 11 at the Edgewater Beach Hotel in Chicago. The Overhead Distribution Group and Underground Group will each have one day of the three-day program. The Overhead Transmission Group, Plant Coordination Group and Standards and Specifications Group will combine their parts of the program into one day's meeting. Considerable organization work has been done during the summer in order to devote the most time to papers and reports on a wide range of subjects.

No inspection trip schedule is being planned. However, for any of those attending the meetings who may wish to visit certain points of interest, special arrangements will be made.

In the interest of promoting the greatest freedom of discussion as is necessary to make the sessions of maximum value, each of the sessions of the meeting will be open for attendance only by committee members and associates employed by member companies, and such others as the chairman specifically invites to attend the various sessions.

Mr. P. H. Chase of the Philadelphia Electric Company is the new chairman of the committee.

Electrical Equipment Committee

W. F. SIMS, Chairman

The fall meeting of the Electrical Equipment Committee will be held Monday and Tuesday, Oct. 7 and 8, at the Edgewater Beach Hotel, Chicago, Ill. The first part of the session Monday morning will be devoted to a closed meeting where the committee will be organized and the procedure for the year outlined. At this session only members of the committee and utility engineers specifically invited are expected to be present. The remainder of Monday, and all day Tuesday will be open meetings which, in addition to the committee members and any engineers from neighboring utilities, members of other committees and a few invited manufacturers' representatives are expected to attend.

(Continued on page 376)

Byllesby Prize Paper

A Guide to the Industry in the Statistical Analysis of Reported Residential Sales

By Samuel J. Helfman

THE attention of the entire utility industry and of the nation has, through force of unusual circumstances, been intently focussed on the characteristics of the most numerous group of consumers—the residential. The energy statistics of residential consumption are carefully scrutinized each month to ascertain the trend of average use per customer by comparison with preceding months and preceding years. The time-factor represented by the monthly statistics have been obscure to many of the industry's statisticians and accountants because of the complication presented by the problem of a rotated meter-reading schedule, by virtue of which the total of meters to be read is distributed through the month. This inevitably results in statistics of reported monthly sales which are not directly related to the number of days in the calendar month for which the accountants render the report, but which depend instead upon the composite of the individual billing periods of the thousands of individual consumers.

The discrepancy between the number of days in the calendar month of the accounting report and composite meter-reading period (hereafter referred to as the "weighted average billing period") may, and frequently does, run as high as 1½ days, or 5 per cent. Even the same month in different years may show a difference between weighted average billing periods, similarly computed, of over 1 day—in other words over 3 per cent. It is the function of this paper to present to the industry a convenient method of calculating the weighted average billing periods so that the monthly time factors which influence the residential statistics may be properly taken into effect in studying trends. Tables for expediting the calculations are included in the paper, and a brief analysis of the basic principles is also given.

Typical Application of Method

The Duquesne Light Company has for several years used this method, which was developed by the author and his associates. The application has been found invaluable not only in the analysis of past statistics, but also in the preparation of budget forecasts for the future. In making residential forecasts of sales and revenue, it has been possible to calculate the weighted-average billing periods as far in advance as desired.

MR. HELFMAN

Mr. Helfman was awarded the Third prize in the 1935 H. M. Byllesby Award.

He is a graduate of the Massachusetts Institute of Technology, 1924, in Electrical Engineering. His early engineering experience was with Stone and Webster in power plant and industrial design and with the Standard Underground Cable Company in cable research.

His experience with the Philadelphia Company and subsidiary companies dates back to 1926, when he entered the employ of the Duquesne Light Company as Electrical Designer. He was later made Sponsor Engineer of that company which position he held for about one year.

In 1928 he joined the Rate Department of the Philadelphia Company as a Cost Analyst, engaged principally in cost allocation work in connection with rate making. At the present time, he is Rate Analyst, and his duties include rate studies, statistical research in electric, gas and steam-heating problems, and budget forecasts of revenue and sales.

Charts 1 and 2, here presented, together illustrate a typical application of the weighted average billing period. Chart 1 shows the trend of average monthly sales per residential consumer, as calculated directly from the accounting reports of monthly sales and month-end consumers, while Chart 2 shows the same ratios after the time-factor has been eliminated by dividing each figure of monthly sales per consumer by the corresponding weighted average billing period. The result in Chart 2 is "average daily sales per consumer (by months)."

Because the time-factor influencing the reported monthly sales is hidden in Chart 1, the apparent trends of monthly sales per customer are frequently very misleading, and lead to conclusions which are contrary to the correct trends of use as revealed by Chart 2. For example, the Chart 1 data indicates an apparent increase in use in November of 3.77 per cent from 1933 to 1934, and in December of only 1.82 per cent between the same two years. To an executive studying this Chart at the end of December, 1934, and preparing to set up a revenue budget for the next few months, this relatively poor showing in December is a matter of some concern. However, Chart 2 shows that the true relative situation of the two months is completely reversed. The reason for the distortion in Chart 1 is that the weighted average billing period for reported November sales was 29.73 days in 1933 and 30.78 days in 1934, an increase of 1.05 days, or 3.53 per cent; whereas the December weighted average billing

November	*1933*	*1934*	*% Increase*
Reported Mo. Sales per Consumer—Kwh.	66.3	68.8	3.77
Weighted Avge. Billing Period—Days	29.73	30.78	3.53
Avge. Daily Sales per Consumer—Kwh.	2.230	2.235	0.22
December			
Reported Mo. Sales per Consumer—Kwh.	71.2	72.5	1.82
Weighted Avge. Billing Period—Days	30.52	30.37	−0.49
Avge. Daily Sales per Consumer—Kwh.	2.333	2.387	2.32

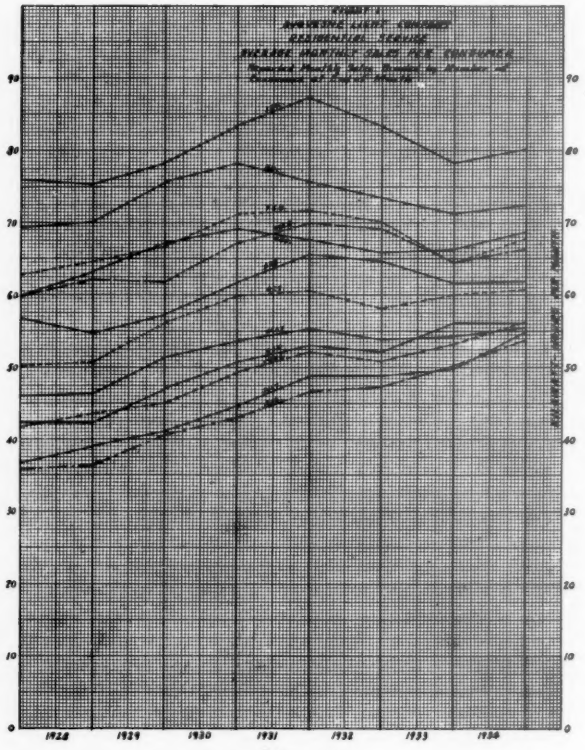


Chart 1

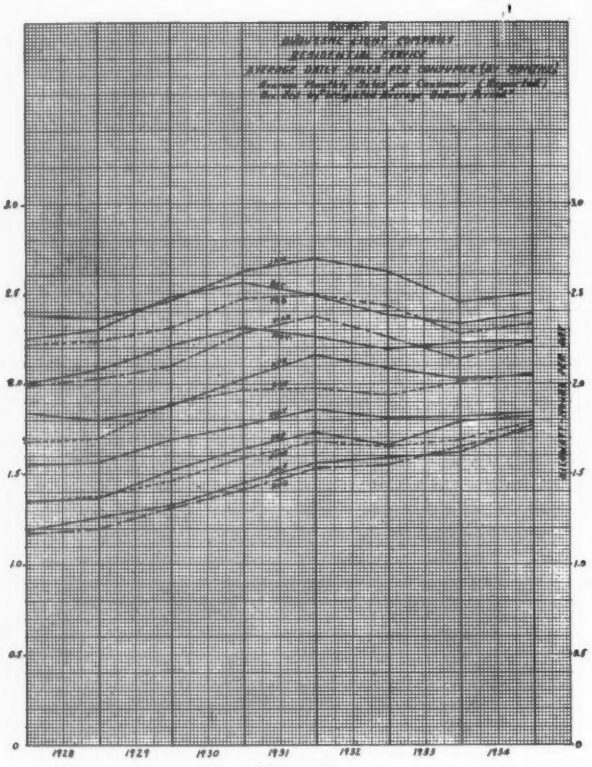


Chart 2

period was 30.52 days in 1933 and 30.37 days in 1934—a *decrease* of 0.15 days, or 0.49 per cent. When the data in Chart 1 is divided by these weighted average billing periods, it is found that the average daily use increased only 0.22 per cent for November, and fully 2.32 per cent for December. This is the situation indicated by Chart 2. A summary of these figures appears at the foot of the preceding page.

Analysis of Weighted Average Billing Period

The number of residential consumers on the distribution systems of most electric utilities is relatively so large that the utility companies must of necessity read the residential meters on a rotating schedule. That is, the meter-readings are distributed pro-rata over the number of available working-days in the month, and the various individual meters are read in approximately the same rotation each month. Thus, meters that are read on the 7th, let us say, of one month, are subsequently read on or about the 7th of the following month, and the specific consumers affected become accustomed to having their meters read on or about that date each month. The expression "on or about" is used very pointedly, since the 7th may fall on Saturday, Sunday, or a legal holiday. (No meters are at present read by the Duquesne Light Company on these days. While this analysis is based on that arrangement, the fundamental basis is applicable to other meter-reading schedules. Prior to November 11, 1933, the Duquesne Light Company also read meters on Saturdays; this should be kept in mind in studying Table 1.) There is also another reason for displacing the customary meter-reading date by a day or more—namely, that in months having different numbers of working days (i.e. meter-reading days) the number of meters to be read per day will differ accordingly, and the number of days required to reach any specific meter on the system may vary from month to month because of this factor alone.

It is the general accounting practice of electric utilities to report as the residential electric sales for any month the aggregate consumer consumption shown by the meter readings made within that month, and to bill the consumers for that month on the basis of these meter-readings. Actually, however, a considerable part of the sales reported in any month represents electric energy delivered and consumed in the preceding month. For example, a meter reading made on the first day of the month shows a consumption all the way back to the first (approximately) of the preceding month; and if we consider all of the meters read on the first as a "unit," then it can be seen that most of the consumption of the meter-reading first unit occurred during the preceding month. Correspondingly, for a unit of meters read about the middle of the month, approximately half of the energy recorded on the meters was consumed in the preceding month, and half in the current month. The relative proportion of recorded energy which was consumed in the preceding month decreases progressively as we advance to the later meter-reading units; so that for the unit which is read on the last day of the month, only a minor portion of the recorded energy was consumed in the preceding month, leaving almost the entire consumption occurring in the current month. The aggregate of all the meter readings made in any month therefore is made up of energy which was delivered and consumed over various portions of some 60 days, more or less (depending on the lengths of the two months).

The effect of this division of total reported monthly sales into separate meter-reading units, combined with the variations from one month to the next in total days, working days, and number and date of Saturdays, Sundays, and holidays, has the result of producing appreciable variations in the meter-

TABLE 1—PROOF OF CALCULATIONS FOR MARCH, 1934, WEIGHTED AVERAGE BILLING PERIOD

February, 1934					March, 1934					March Weighted Average Billing Period:	
			Cumulative Effective Unit-Days					Cumulative Effective Unit-Days			
Day of Month	Saturday, Sunday and Holidays	Meter Units Read	Succeeding Month	Current Month	Day of Month	Saturday, Sunday and Holidays	Meter Units Read	Succeeding Month	Current Month	From Feb.	14.18
										From Mar.	15.55
1	..	1	0.5	18.5	1	..	1	0.5	21.5	Total.	29.73
2	..	1	1.5	17.5	2	..	1	1.5	20.5		*Checks:*
3	1	0	2.0	17.0	3	1	0	2.0	20.0		
4	1	0	2.0	17.0	4	1	0	2.0	20.0	269.5	
5	..	1	2.5	16.5	5	..	1	2.5	19.5	262.5	
6	..	1	3.5	15.5	6	..	1	3.5	18.5		
7	..	1	4.5	14.5	7	..	1	4.5	17.5	532.0	
8	..	1	5.5	13.5	8	..	1	5.5	16.5		
9	..	1	6.5	12.5	9	..	1	6.5	15.5	28	
10	1	0	7.0	12.0	10	1	0	7.0	15.0	19	
11	1	0	7.0	12.0	11	1	0	7.0	15.0		
12	..	1	7.5	11.5	12	..	1	7.5	14.5	532.0	*Check*
13	..	1	8.5	10.5	13	..	1	8.5	13.5		
14	..	1	9.5	9.5	14	..	1	9.5	12.5	14.18	
15	..	1	10.5	8.5	15	..	1	10.5	11.5	13.82	
16	..	1	11.5	7.5	16	..	1	11.5	10.5		
17	1	0	12.0	7.0	17	1	0	12.0	10.0	28.00	*Check*
18	1	0	12.0	7.0	18	1	0	12.0	10.0		
19	..	1	12.5	6.5	19	..	1	12.5	9.5	340.0	
20	..	1	13.5	5.5	20	..	1	13.5	8.5	342.0	
21	..	1	14.5	4.5	21	..	1	14.5	7.5		
22	1	0	15.0	4.0	22	..	1	15.5	6.5	682.0	
23	..	1	15.5	3.5	23	..	1	16.5	5.5		
24	1	0	16.0	3.0	24	1	0	17.0	5.0	31	
25	1	0	16.0	3.0	25	1	0	17.0	5.0	22	
26	..	1	16.5	2.5	26	..	1	17.5	4.5		
27	..	1	17.5	1.5	27	..	1	18.5	3.5	682.0	*Check*
28	..	1	18.5	0.5	28	..	1	19.5	2.5		
29	..	..	....	....	29	..	1	20.5	1.5	15.45	
30	..	..	....	....	30	..	1	21.5	0.5	15.55	
31	..	..	....	....	31	1	0	22.0	0.0		
Total	9	19	269.5	262.5	Total	9	22	340.0	342.0	31.00	*Check*
Wtd. Av.	Days		14.18	13.82	Wtd. Av.	Days		15.45	15.55		

reading periods covered by the various meters read during the month. The composite time-effect of all these individual meter-reading periods (or billing-periods, since bills are based on meter-reading periods) is mathematically equal to their "weighted average," and, as stated above, represents the time-factor to be used in adjusting the reported monthly sales.

Of course, the calculation of the weighted average of several hundred thousand individual items each month would be a formidable task, but no such detailed procedure is necessary. Very satisfactory results may be achieved by a comparatively simple calculation, which is as accurate as practical conditions will require. As an illustration, see Table 1, which gives all the steps in the calculation of the weighted average billing period for March, 1934, for a system where no meters are read on Saturdays, Sundays, and legal holidays. Graphically, the basis for this March, 1934, calculation is illustrated by the diagram, Chart 3. This table and diagram are here presented in the nature of a proof of the method. The same result—namely, a weighted average billing period of 29.73 days, applicable to the reported March, 1934, sales—may be calculated still more simply in a few minutes by using the rapid calculation tables, Tables 3 and 4.

The application of these tables to the conditions prevailing in the Duquesne Light Company territory results in the weighted average billing periods shown in Table 2, for the years 1927 to 1934, inclusive. These billing periods are the ones used in the preparation of Chart 2.

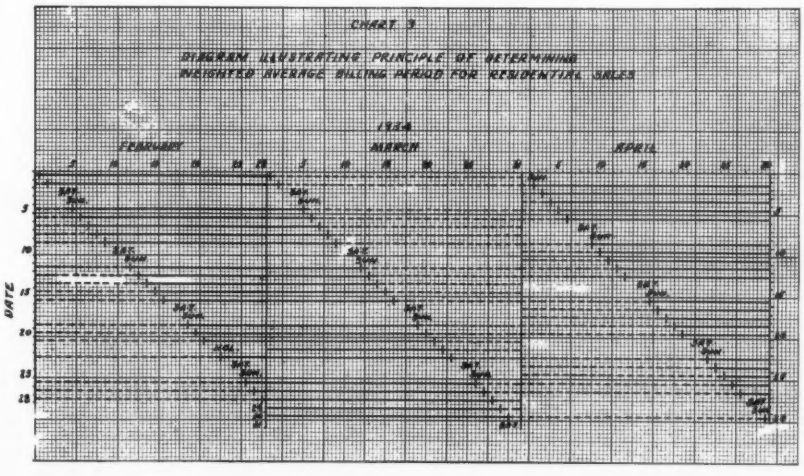


Chart 3

Table 2—Weighted Average Billing Periods Applicable to Reported Monthly Residential Sales of the Duquesne Light Company

(Used in Preparation of Chart 2)

	1927	1928	1929	1930	1931	1932	1933 (Note A)	1934
January	31.87	31.91	31.86	31.81	32.39	31.82	31.91	32.02
February	28.23	28.87	28.85	28.87	28.84	28.89	28.24	29.00
March	30.10	30.60	29.46	29.48	29.54	30.64	30.07	29.73
April	30.88	30.38	30.38	30.35	30.31	30.88	30.33	30.19
May	29.83	29.78	30.35	30.34	29.74	29.83	29.83	30.12
June	30.86	31.43	30.86	30.91	30.95	30.86	31.42	31.40
July	30.78	30.87	30.83	30.78	31.35	30.78	30.83	30.76
August	30.50	30.39	30.99	30.43	30.46	30.50	30.45	30.83
September	31.30	30.85	30.95	30.95	30.68	31.30	31.35	30.81
October	29.92	29.86	29.76	30.32	30.54	29.92	29.91	29.49
November	30.00	30.34	30.39	29.85	29.95	30.00	29.73	30.78
December	30.85	30.52	30.52	30.50	30.41	30.85	30.52	30.37
Total	365.12	365.80	365.20	364.59	365.16	366.27	364.59	365.50

Note (A)—Prior to November 11, 1933, meters were read daily except Sundays and legal holidays, but beginning with that date readings were discontinued on Saturdays.

Table 3—Totals of Cumulative Effective Unit Days for Months Without Holidays. Meters Read Daily Except Saturdays or Sundays

Date of First Saturday	31-Day Month		30-Day Month		29-Day Month		28-Day Month	
	Current Month	Succeeding Month	Current Month	Succeeding Month	Current Month	Succeeding Month	Current Month	Succeeding Month
1	330.5	320.5	300.0	300.0	300.0	280.0	300.0	260.0
2	320.5	330.5	320.5	309.5	320.5	288.5	292.0	268.0
3	342.0	340.0	342.0	318.0	312.5	296.5	284.0	276.0
4	364.5	348.5	334.0	326.0	304.5	304.5	276.0	284.0
5	356.5	356.5	326.0	334.0	296.5	312.5	268.0	292.0
6	348.5	364.5	318.0	342.0	288.5	320.5	260.0	300.0
7	340.0	342.0	309.5	320.5	280.0	300.0	280.0	280.0

Table 4—Totals of Cumulative Effective Unit Days for Months Without Holidays. Meters Read Daily Except Sundays

Date of First Sunday	31-Day Month		30-Day Month		29-Day Month		28-Day Month	
	Current Month	Succeeding Month	Current Month	Succeeding Month	Current Month	Succeeding Month	Current Month	Succeeding Month
1	408.0	398.0	377.5	372.5	348.0	348.0	348.0	324.0
2	403.0	403.0	372.5	377.5	372.5	352.5	344.0	328.0
3	398.0	408.0	398.0	382.0	368.5	356.5	340.0	332.0
4	424.5	412.5	394.0	386.0	364.5	360.5	336.0	336.0
5	420.5	416.5	390.0	390.0	360.5	364.5	332.0	340.0
6	416.5	420.5	386.0	394.0	356.5	368.5	328.0	344.0
7	412.5	424.5	382.0	398.0	352.5	372.5	324.0	348.0

Brief Explanation of Basic Method of Determining Weighted Average Billing Period

1. This method follows the operating practice of varying the number of meters to be read per working day in accordance with the number of working days in the month. In February, 1934, for example, there were 19 working days, and the total number of meters was divided into 19 "units," or groups. These units in any one month are considered in the calculations as containing equal numbers of meters. (Where the total number of residential meters on the system runs into the tens of thousands, and even hundreds of thousands, the actual conditions approach this assumption very closely.) In March, 1934, on the other hand, there were 22 working days, and the total number of meters was divided into 22 units each unit containing approximately 19/22 as many meters to be read per day as in a February unit.

2. Considering now any single meter read in February, it is obvious that the amount of electric energy which passes through that meter during the calendar month of February will be divisible into the following two portions: (a) the consumption from the beginning of February up to the moment of reading the meter will be included in the customer's February bill, and likewise in the accounting report of sales for February, and (b) the remaining consumption (from the moment of meter reading to the end of

February) will fall into the March bill and report. For a unit of meters, it is equally obvious that part of its aggregate calendar-month consumption falls into the February reports, and the remainder into the March reports. This division, for any unit, may be simplified by considering that all meters are read at noon—which is very close to the median of the unit, since noon is about the middle of the meter-reader's working day in the field. It is this assumed division at noon which introduces the halves into the calculations in Table 1.

3. In Chart 3, a dot is shown at noon of each day on which meters were read in the months of February, March, and April, 1934, and the horizontal line symbolizing the calendar-month consumption of each unit is divided by the dot, to indicate the number of days' consumption falling into the current month's sales report and the number of days' consumption falling into the succeeding month's sales report. An inspection of this diagram will show that on Feb. 7, for example, all of the energy consumed by 14 meter units, and half of the energy consumed by one unit, falls into the February sales report, since this consumption occurred prior to the February meter-readings of these respective units. Similarly, all of the energy consumed on that day by four meter units and half of the energy consumed by one unit falls into the March sales report, since that consumption occurred subsequent to the February meter-readings of these respective units. Correspondingly, the weight 14.5 appears in Table 1 in the column headed "Cumulative Effective Unit Days," under "Current Month," and the weight 4.5 appears in the same column under "Succeeding Month."

4. This procedure of "weighting" is carried out in Table 1 for each day of February and March in accordance with the diagram. The February weights (expressed as "cumulative effective unit-days") for the "succeeding month" total 269.5. Dividing this by 19 units gives 14.18 days as the weighted average period represented by the energy consumed in February, *but* appearing in the March sales reports and bills. The March weights for the "current month" total 342.0 cumulative effective unit-days. Dividing this by 22 units gives 15.55 days as the weighted average period, represented by the energy consumed in March *and also* appearing in the March sales reports and bills. The sum of 14.18 days and 15.55 days (or 29.73 days total) is the weighted average billing period of the total sales reported for March and billed for March.

5. For a different meter-reading schedule, where Saturday is considered as a working-day for the purposes of meter-reading, the diagram of Chart 3 would be revised by the introduction of horizontal lines for Saturdays where there are now blank spaces, and the number of units and the accumulation of weights in Table 1 would be revised accordingly.

Tables for Rapid Calculation of Weighted Average Billing Periods

Tables 3 and 4 have been prepared for two respective types of meter-reading schedules: Table 3 applies where meters are read on all days except Saturdays, Sundays, and legal holidays; while Table 4 applies where meters are also read on Saturdays. Each table gives directly for any calendar month having no legal holidays the "cumulative effective unit days" representing (a) the energy consumption falling into the current month's sales report and (b) the energy consumption falling into the succeeding month's sales report. These tables eliminate most of the work of calculating the weighted average billing periods, since it becomes unnecessary each month to go through the detailed procedure in Table 1 to arrive at these cumulative totals.

However, when a month contains a legal holiday (New Year's Day, Washington's Birthday, etc.) it is necessary to adjust the cumulative effective unit days in the table by the following rules. These rules are the same for both types of schedules.

Rules for Months Having Legal Holidays

A) *Cumulative Effective Unit Days—Current Month*
   1) Subtract ½ day from the date of the holiday.
   2) Subtract the result from the cumulative effective unit days given in the table.

B) *Cumulative Effective Unit Days—Succeeding Month*
   1) Subtract the date of the holiday from the number of days in the month.
   2) Add ½ day.
   3) Subtract the result from the cumulative effective unit days given in the table.

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also fix the terms of such arrangements. The FPC may issue such an order with or without notice, hearing or report [Sec. 202(c)].

(3). FPC may fix reasonable rates, charges or classifications for any sale or transmission of energy subject to its jurisdiction [Sec. 206].

(4). FPC may, upon application by a State Commission, require changes in the standards of interstate service rendered by a public-utility subject to same limitations mentioned in paragraph next above [Sec. 207].

(5). FPC, after hearing, may direct a public-utility to carry a proper and adequate depreciation account and, by order, after notice and opportunity for hearing, fix the rates thereof [Sec. 302].

(6). FPC may determine the actual legitimate cost of the property of a public-utility, the depreciation therein and, when necessary for rate making purposes, other facts bearing on its fair value. FPC may also require a public-utility to supply an inventory of its properties and the original cost thereof, and to keep FPC informed as to the cost of additions and betterments thereto [Sec. 208].

(7). Section 301 requires every public-utility to make, keep and preserve such accounts, memoranda, papers and other records as FPC may prescribe, but such public-utility is not thereby relieved from keeping any such accounts and records as may be required under any State law. FPC may prescribe a system of accounts to be kept by public-utilities and shall at all times have access to and the right to examine all accounts, records and memoranda of public-utilities and to call upon public-utilities for any information with respect thereto which FPC may by order require. The books, accounts, memoranda and records of any person who controls a public-utility and of any other company controlled by such person, in so far as they relate to the business of such public-utility, shall also be subject to examination on order of FPC [Sec. 301].

Under Section 209, FPC is authorized to refer any matter arising in the administration of Part II of Title II to a Board composed of members from each State affected by the matter so referred. The power of such a Board and its personnel are subject to control by FPC, but any such Board is to be selected from persons nominated by the States in question.

Attention is called to Sections 318 which provides that if, with respect to any matter, any person is subject both to a requirement of the Public Utility Holding Company Act of 1935 (i.e., Title I) and to a requirement of the Federal Power Act, the requirement of the Public Utility Holding Company Act of 1935 shall apply to such person and such person shall not be subject to the requirement of the Federal Power Act with respect to the same subject matter unless SEC has exempted such person from such requirement of the Public Utility Holding Company Act of 1935, in which case the requirement of the Federal Power Act shall apply to such person.

Building Foremen to Appreciate Accident Prevention

By C. J. Rutland

Director of Safety, Texas Power & Light Co., Dallas, Texas

Ninth of a series of articles sponsored by the Accident Prevention Committee,
W. A. BUCHANAN, *Chairman*

YEARS AGO the industrial safety movement accepted as one of its principal foundation stones, the practical theory that the foreman is an important key to the success of the accident prevention program. Those organizations which through the years have builded on and expanded this theory, have achieved definite results in accident reduction, improved efficiency, better employee morale and greater discipline. It is a demonstrated fact that if a workman is carefully selected for a position and then thoroughly trained so every job that he does is performed exactly 100 per cent right, the perfect safety answer is nearly obtained—the job is performed in an efficient manner, no one is injured and no money is spent for wasteful accidents. A workman gets hurt only when he does something wrong. The foreman is the one person to eliminate wrong habits. He is the key man to teach safe habits and efficient work to his men.

In all successful accident prevention work, the above facts are held paramount and are never side-stepped.

Building foremen to appreciate accident prevention work is just as essential as providing them with blue prints and manuals to install equipment, to build and maintain lines or as issuing instructions to them regarding the selection of workmen for jobs. The prime objective is to make the foreman safety-minded and deeply concerned about accidents, their causes and costs, in order that when one does occur he will automatically analyze the causes and ask: was I responsible in any degree for the cause of this accident; was the injured the right man to put on this job; was I sure of his qualifications; did I know he had previously been using this unsafe practice; what was his attitude about respecting my instructions; did I train this man to do the job in the right way?

The foreman's boss and the Safety Engineer are the two persons who can bring about this attitude of mind. The foreman can prevent accidents if he really wants to and if his boss makes it clear that he, too, demands a no-accident record.

How can this attitude be created? Different companies approach the objective from different angles. Certainly the head of the department or the superintendent over the foreman must reflect his executive view point and interest in safe operating practices. The superintendent in most cases determines what work is to be carried out, not the workman; he, not the employee, decides where a line is to be built or where installation is to be made; he selects the kind of material to be used; he designates the rate of pay which shall prevail; he determines how many men are to be employed on the job and decides practically all policy matters dealing with employee and employer. All of these basic principles are under the control of the superintendent, and if he wishes to inculcate in the foreman the principles and habits of safe practices, he must discharge his own responsibility first. Each foreman must eventually be convinced so there remains no doubt in his mind as to how "the big boss" feels about an accident. If the boss is sincere in his own safety-mindedness, the safety answer will be obtained. If he is not, the successful answer will not be forthcoming. If he is sincere he will demonstrate by many ways his executive interest. He will place safety at the head of the list of subjects at the foremen's meetings. He will authorize reasonable expenditures for safety. He will readily notice dangerous conditions and safety improvements on his general visits of inspection. He will observe the unsafe practices of workmen and immediately summon the foreman and require their correction. He will exhibit a personal interest in the general provisions for medical treatment and compensation. He will not be indifferent to employees' losses and sufferings. He will demand strict discipline in the execution of company orders.

If a serious accident occurs, a rigid investigation is made and the fundamental causes determined. The facts are presented to the superintendent who calls in the foreman and reprimands him, if there has been negligence in his leadership or method of supervision of the work. He demands disciplinary measures, if there has been a violation of rules, poor judgment, haste, failure to inspect, or other unsafe practices.

Parallel to this line of emphasis on accident prevention, the safety engineer approaches the goal of foreman interest by the use of a little different vehicle. He is the adviser, the stimulator, the developer. He becomes the friend of the foreman. His educational plan is to point out that safety and efficient production are one and the same—accidents and efficiency cannot exist in the same crew. He reflects that accidents which cause physical injury and medical bills are no different from accidents that cause damage to equipment and interruption to service. He stresses the truth that if a foreman, who is put in charge of men, cannot regulate their operating practices, he cannot be expected to efficiently handle production and assume responsibility for the care of expensive equipment placed in his charge. He touches the emotional side of the foreman when he pictures the moral obligation to his men, what a serious accident means to the foreman's own pocket book, depleted by unusual expenses; his job endangered by the advent of a new man; his home life torn by the tragedy of an accident, and his own physical body suffering from pain and worry. He emphasizes the fact that the foreman is placed in his position because he is supposed to possess a greater knowledge of the operation of the business than the man whose work he supervises; he is responsible for the safety of his men and must create respect and dignity for his rules and instructions. He teaches first aid and resuscitation, and stimulates the foreman's enthusiasm to keep this at a high interest among his men. He investigates accidents in the presence of the foreman and

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Shunt Capacitors and Their Application

A Report of the Electrical Equipment Committee, Edison Electric Institute,
W. F. SIMS, *Chairman*

CAPACITORS (Static Condensers) are used for various purposes, such as for power factor correction, reduction in motor starting current, reduction in voltage fluctuation, protection of synchronous equipment, in tuned resonant devices, etc. In general, capacitors must be applied more carefully than most types of electrical equipment. This is particularly true for installations involving equipment of fairly large capacity, and where the combined effects of the characteristics of the capacitor, of the electricity supply system, and of adjacent customers' equipment must be taken into account.

Much interest is being exhibited in capacitor installations on customers' premises designed to raise the power factor of the load, where commercial and operating advantages may be realized. Such installations are usually owned by the customer. The capacitor manufacturer's chief obligation would seem to be to construct capacitors of high grade, of suitable rating and with adequate tolerance regarding characteristics. The electricity supply company's chief concern is that the customers' equipment shall operate satisfactorily. It is thought that a presentation of some of the considerations involved in capacitor applications will aid in the promotion of good relationships.

There is, therefore, presented herein: a review of the characteristics of capacitors, in which are pointed out those factors which should be given special consideration in the application and operation of this type of equipment; a suggested Purchase Inquiry form which is intended to assist in quickly and adequately setting forth the information required; and a summary or Guide designed to assist the purchaser in preparing the Purchase Inquiry.

Description of Equipment

Capacitors for power factor correction and for similar applications are made in various sizes, types and voltage ratings generally ranging from 240 volts to 7200 volts and higher, and may be built for indoor or outdoor service. They may be of the single unit or box type or of the rack type, consisting of several units arranged in parallel. Capacitor units usually consist of rolls or packs of alternate layers of paper and metal foil either immersed in a suitable liquid dielectric, such as high grade oil or a similar fluid having good dielectric properties, or impregnated with a suitable compressed gas.

Most of the larger capacitors are of the rack type and are provided with an oil or air circuit breaker as a disconnecting device. Auxiliary switches are used to furnish control for an alarm or similar indication showing when the disconnecting device has operated and the capacitor is out of service. In addition to the main disconnecting device, individual units may have separate internal or external fuses.

Small individual capacitor units may be connected directly to the terminals of other equipment such as induction motors, and the motor control switch or fuses may be relied upon for disconnecting the unit from service.

Most capacitors of any considerable size are provided with a suitable discharge device to dissipate the energy which may remain within a unit after it has been disconnected from service. This discharge device may be a high resistance conductor or an inductive coil short-circuiting units.

Ammeters and switches may be provided for checking the amount of current and the current balance to determine whether all units are in operating condition.

Manufacturers' catalogs and bulletins give additional descriptive information relative to various types of capacitors.

Operating Characteristics
Voltage Rating

A capacitor must be operated within the limits of its designed voltage rating, possibly to a greater extent than other electrical equipment, in order to assure satisfactory operation. The kva output of a given capacitor varies directly as the square of the impressed voltage. However, the use of equipment rated at a nominal voltage for actual operation at a higher operating voltage in order to obtain greater kva rating for the same frame size is not recommended, since operation at voltages greater than those contemplated by the designer may appreciably shorten the life of the capacitor.

An important voltage rating of a capacitor is the maximum permissible continuous operating voltage. The nominal or name plate voltage rating upon which the kva capacity of the capacitor is based will be lower than this maximum value by some percentage, depending upon the practise of the manufacturer. A limiting standard for all manufacturers has, however, been formulated by the American Institute of Electrical Engineers and adopted by the American Standards Association.

According to this American Standard Association Standard, No. C55-1934, capacitors shall be suitable for continuous operation at 110 per cent of rated voltage and for temporary overvoltages not exceeding 120 per cent of rated voltage. Thus both the actual normal operating voltage and the maximum voltage which may be sustained for short periods of time must be taken into consideration. In the determination of these voltages, it must be remembered that a capacitor draws a leading current from the line and therefore tends to raise the normal operating voltage above that which would otherwise exist. This voltage rise is amplified in the following situations.

(a) The existence of a relatively high reactance in line, transformer or other equipment between the power supply and the capacitor.

(b) The installation of a capacitor relatively large in capacity as compared with the line or transformer capacity.

(c) The operation of the capacitor during times when the circuit is lightly loaded.

(d) The sudden loss of load on certain transmission and hydro-generating systems.

In general, it is considered desirable to base the design of capacitors on the higher rather than the lower value of voltage to be expected, even though the kva capacity be somewhat reduced at the lower operating voltage levels. This practise reserves the margin of tolerance required by the A.S.A. Standard for the unusual operating condition.

On this basis, capacitor voltage ratings which would seem to be suitable for standardization by manufacturers for usual service conditions would be as follows:

*Nominal System Voltage	Probable Normal Operating Voltage	Suggested Standard Capacitor Voltage Ratings On Basis of A.S.A. Standard No. C55-1934 Normal Voltage Rating (100%)	Maximum Continuous Voltage Rating (110%)	Maximum Short Time Voltage Ability (120%)
220	220- 250	240	264	288
440	440- 500	480	528	576
550	550- 625	600	660	720
2300	2300-2650	2400	2640	2880
4000	4000-4590	4160	4576	4992
4600	4600-5300	4800	5280	5760
6600	6900-7950	7200	7920	8640

* Values taken from N.E.L.A.-N.E.M.A. Joint Report on "Preferred Voltage Ratings for A-c Systems and Equipment," April, 1930.

Some manufacturers are using a series of Normal Voltage Ratings about 4 per cent lower than is indicated in this table, but at the same time are allowing a Maximum Continuous Voltage Rating of 115 per cent of this Normal Voltage Rating. This method results in Maximum Continuous Voltage values practically equal to those of the above table and may therefore be acceptable provided the Maximum Short Time Voltage Ability is also as shown above, and provided that other important characteristics, such as maximum allowable current ability, are not sacrificed.

Current Rating

The current drawn by a capacitor is proportional to the frequency as well as to the voltage. A capacitor should not be operated continuously at currents substantially above its Maximum Continuous Current Rating. System voltages are not exactly sine waves, and capacitors will always draw some harmonic current. The total current drawn by a capacitor will be the square root of the sum of the squares of the fundamental and harmonic currents.

It is important that a capacitor be so designed as to safely carry a reasonable amount of harmonic current when operating at the Maximum Continuous Voltage Rating, since it is usually at the higher values of voltage associated with light load conditions that difficulties due to harmonic currents are experienced, if at all. A capacitor will take current of fundamental frequency in proportion to the operating voltage. If, therefore, the Maximum Continuous Voltage Rating be 110 per cent of Normal Voltage Rating, the fundamental frequency current at this voltage will also be 110 per cent of Normal Current Rating, and the corresponding kva will be 121 per cent of Normal Kva Rating. It seems reasonable to expect a capacitor to safely carry a total current including harmonics, of the order of 10 per cent above the current value corresponding to the Maximum Continuous Voltage Rating. Thus a capacitor designed to operate continuously at 110 per cent of rated voltage should have a Continuous Current Rating of at least 120 per cent (110 + 10) of rated current when operating at a voltage not to exceed this Continuous Voltage Rating.

Similarly, a capacitor which has a Maximum Continuous Voltage Rating of 115 per cent of Normal Voltage Rating will, at this voltage, take 115 per cent of rated current at normal frequency, with a corresponding kva output of 132 per cent of rating. A capacitor rated in this manner should, therefore, have a Maximum Continuous Current Rating of at least 125 per cent (115 + 10) of rated current when operating at not to exceed the Maximum Continuous Voltage Rating.

The matter of sustained fundamental frequencies higher than normal should be taken into consideration where capacitors are used for surge protection of hydro generators, since under overspeed conditions the capacitors may be subjected to abnormally high frequency as well as to abnormally high voltage, both of which tend to increase the current drawn by the capacitor.

Losses and Temperature Rise

The losses in a well designed capacitor are normally of very low value, the usual watts loss being from 0.25 to 0.33 per cent of the kva rating.

The normal temperature rise of most capacitors as at present designed does not exceed 25 deg. C. under the usually allowable operating conditions. The temperature of the dielectric material is the item of importance and not the temperature of the container. The temperature gradients existing between the dielectric material and the container may vary widely in capacitors of different design and manufacture.

The heating of capacitor conducting parts may under certain unusual conditions, increase at a greater rate than the square of total current due to the fact that the skin effect increases with the frequency and the heating due to harmonics which may be encountered will be greater than that due to the fundamental.

Application of Capacitors

Before capacitors are purchased, the proposed installation should be given a thorough study with respect to the following items:

(a) Size and type.
(b) Voltage rating.
(c) Protective equipment.
(d) System characteristics.

Size and Type

The proper amount of capacitance to be installed depends upon the purpose of the installation. Some common applications are mentioned below.

Capacitor equipment intended for power factor correction will be of the capacity dictated by commercial considerations. It may be that synchronous motors or synchronous condensers will, in certain situations, provide a proper solution to the commercial problem and solve a problem of resonance or other troublesome condition which occasionally may militate against the installation of a capacitor.

In installations where improvement is desired in motor starting duty, where during the starting period the capacitor will be connected in parallel with the motor, data should be available regarding the characteristics of the motor involved and the allowable limits of voltage drop, current inrush, etc.

The use of the capacitors for the surge protection of synchronous equipment is still somewhat in the developmental stage and the amount of capacitance to be used depends upon the characteristics of the synchronous equipment and the protective requirements.

The use of capacitors for series connection in power lines involves engineering problems outside the scope of this discussion.

Capacitors used for filters and similar resonant devices should be constructed so as to operate satisfactorily at harmonic frequencies. Certain types of capacitor construction which may be satisfactory at sixty cycles may be ineffective at the higher frequencies. The capacity and type must therefore be carefully coordi-

nated with the operating requirements of the equipment.

Voltage Rating

The importance of the effect of operating voltage on the performance of a capacitor has been stated. The voltage conditions under which the capacitor must operate should be thoroughly investigated before purchase and the actual operating voltage at the point of connection of the capacitor determined. Voltages during times of light load are especially important. In some cases it will be found necessary to take into account seasonal variations of load and voltage in addition to the daily or weekly voltage cycle.

Protective Equipment

A capacitor installation should be arranged so that the capacitor will be promptly disconnected from service in case it draws excess current due to an internal fault, resonance or for any other reason. The protective equipment used, whether air circuit breakers, oil circuit breakers, or fuses, must be adequate to interrupt the short circuit current which may be experienced.

Individual fuses may be advantageous with many types of installations since if one capacitor unit fails it will be automatically cleared from the circuit and the remainder of the capacitor continued in service. However, where a customer is depending upon the full capacity of the capacitor to restrict his metered demand, the use of individual fuses may prove to be a disadvantage, since it is then possible to have a number of capacitor units disconnected without this being realized. An adequate fuse inspection schedule maintained by the customer may obviate this possible difficulty. An ammeter installed in the capacitor circuit may also be of assistance, indicating values of current less than normal when certain units have been disconnected by fuse operation. If individual fuses are used, operating experience has shown that external fuses are preferable to internal fuses in most cases.

System Characteristics

In addition to the matters already discussed, consideration must be given to the power system wave shape. In general, it can be expected that capacitors will operate satisfactorily on most system wave shapes, provided there be no resonant condition.

The wave shape of most power systems is reasonably good although not exactly a sine wave. If it is suspected that the wave shape at the proposed installation may be unusually bad, it may be checked by making a wave shape analysis using an oscillograph, an oscilloscope or a harmonic analyzer. The wave shape of the system without the capacitor in service is of significance. From the values of the various harmonic voltages thus determined, corresponding currents may be calculated, provided the connection of the capacitor to the system shall not bring about a resonant or partially resonant condition.

As discussed in a previous paragraph, the heating effect of the harmonic currents upon capacitor units may be considered upon a kv-a or upon a current basis. If current be used as a basis, the total resultant current will be equal to the square root of the sum of the squares of the fundamental and various harmonic currents. It is evident that there may be fairly high values of harmonic currents present, yet with a relatively small increase in total current. The maximum current carrying capacities of various manufacturers' capacitors have in the past varied from 110 per cent to 150 per cent of the normal rated current on a sine wave basis. It is therefore well to determine from the manufacturer that the capacitor has sufficient current carrying capacity to satisfactorily carry the total current to be expected.

Harmonic currents, if present, may affect associated equipment such as circuit breakers, disconnecting switches, conductors and trip coils, and these may overheat due to amplification of the medium frequency components in the current wave. Under extreme conditions a metering problem may also arise, since harmonic currents know no metering point.

Harmonic currents may be reduced by the use of a series reactor which detunes the resonance or by means of a harmonic suppressor (wave trap) which introduces a high impedance in the capacitor circuit. Either of these devices will reduce the current and the temperature rise caused thereby. The harmonic suppressor is preferable to the reactor since the suppressor has practically no effect on the sixty cycle performance of the capacitor, whereas the use of a reactor alone will cause an increase in the fundamental voltage impressed on the capacitor. Consequently, if a capacitor installation requires the installation of a reactor, the voltage and kva rating of the capacitor should be coordinated with the characteristics of the series reactor. Usually it is necessary to specify a capacitor of higher voltage rating and of greater kva capacity when a series reactor is used.

Another solution which may be helpful in such cases is to add to or reduce the size of the capacitor installation, thus changing the constants of the circuits and possibly eliminating the difficulty. This is only feasible when it is possible to change the capacity of the installation.

The possible mutual effect of the proposed capacitor installation with capacitors operating in adjacent plants fed from the same circuit may warrant investigation in cases where the total amount of capacitance is relatively large.

Resonance

Resonance occurs when the capacitive and inductive reactances of the circuit are approximately equal. Harmonic currents produced by the magnetization of the transformers, flash type welders, system wave shape, etc., may contribute to a resonant condition. Under conditions of resonance or partial resonance, the voltages and currents in a capacitor installation will be higher than normal. Fortunately, resonance has apparently occurred but very infrequently, although some cases of such trouble which have been experienced have been quite serious.

There are a number of fortuitous circumstances which normally tend to mitigate against resonance, such as the dampening effect of the load connected to the circuit, circuit impedance between the installation and the source of the harmonics, and the relative size of the capacitor installations as compared with the transformer capacity. Among other contributing factors: a capacitor may parallel more than one transformer bank, some of which may be disconnected at times; a rather large capacitor may be connected to a bus which may be lightly loaded at times, in contrast to installations energized only when associated motors are in operation; an induction furnace may contribute to the problem; the harmonics produced by an arc furnace may be of importance; open delta or Scott connected transformers may tend to produce unbalances; and transformers operating at unusual flux densities may produce harmonics which will be amplified by the capacitor.

While calculations are useful in indicating whether or not resonance may be expected, it can not easily be determined with absolute certainty that resonance will or will not occur in par-

ticular instances. The fact that the great majority of installations made to date have been free from serious harmonic or resonant troubles indicates that favorable aspects are dominant and that the capacitor installation which encounters such trouble will likely be in the great minority. It would seem, however, that an effort should be made to anticipate even these relatively few cases of trouble in the furtherance of good customer relations.

Purchase of Capacitors and Associated Equipment

A purchase inquiry form and a guide to assist in its preparation are a distinct convenience, both to purchaser and manufacturer. Such a suggested purchase inquiry and guide are reproduced in the appendix. Their general use should promote understanding of the requirements to be met, and should tend to eliminate inequalities and inadequacies in proposals.

APPENDIX

Suggested Guide for Preparing Purchase Inquiry

CAPACITOR—STATIC CONDENSER

General

A simple outline of capacitor requirements and operating conditions serves not only to call the attention of the purchaser to the various requirements, but also serves as a medium to transmit concise information to the manufacturer.

This guide may be followed in preparing inquiries for all capacitors (static condensers) except small, low voltage units such as are used with single phase condenser type motors, and units for series connection in power lines.

A sufficient number of copies of the completed purchase inquiry should be prepared to provide at least three copies for each manufacturer and to provide copies for all necessary files. Headings shown in this guide correspond to the similar headings of the purchase inquiry.

Type and Rating

According to A.S.A. Standard No. C55-1934, capacitors or static condensers for operation on alternating current power circuits are to be rated in Kva, Frequency, Voltage, and Number of Phases. For a three-phase installation, the kva rating should be on a three-phase basis.

The voltage rating is very important. Nominal voltages must not be given, but the actual operating voltage to be expected at the condenser terminals should be indicated. The effect of the capacitor in raising the operating voltage, particularly at light load, should be considered.

The standard ratings, in the adjoining column, are suggested as suitable for a large number of installations.

Capacitor Voltage Rating* (A.S.A. Basis)	Maximum Continuous Operating Voltage (A.S.A. Basis—110% of Normal Voltage Rating)
240 volts	264 volts
480	528
600	660
2400	2640
4160	4576
4800	5280
7200	7920

*This value may be lower providing the values in the second column are guaranteed.

Particular Requirements

Capacitors are generally connected to the circuit by means of an oil or air circuit breaker, or fuses. The particular equipment to be used in any installation must be adequate to interrupt the maximum short-circuit current which may be experienced, and also to open the circuit reliably when currents which exceed the ability of the capacitor are experienced.

Switching equipment — Whether or not it is desired to have an oil circuit breaker furnished should be specified. If so, it should be covered by a separate purchase inquiry. Suitable overcurrent protection should always be provided.

Auxiliary equipment—Auxiliary equipment desired, such as an ammeter and transfer switch, current transformer (insulation strength and current rating), panel, etc., should be specified. Switchboard specifications, if required, should be prepared.

Capacitors intended for use with resonant devices or harmonic suppressors should be required to be suitable for such service.

Proposed Operating Conditions

It is important that the manufacturer be given complete information regarding the proposed installation to assist him to determine whether or not any special operating conditions may be involved which will require special consideration. It is particularly important that the size and connections of the power transformer bank be given, and the normal and maximum operating voltages.

The maximum short circuit duty (amperes) at the point of installation should be given so that switching equipment of adequate interrupting capacity may be provided.

The manufacturer's attention should also be called to installation conditions involving exposure to damaging fumes, salt air, moisture, high ambient temperatures, bad dust conditions or abnormal vibration.

Capacitor units are ordinarily designed to operate on a circuit having a fair wave form, and very few modern commercial circuits contain sufficient harmonics in the voltage wave shape to cause trouble. However, if the circuit has a poor wave form, this point should be brought to the attention of the manufacturer so that protective measures may be applied if necessary. The presence of an arc or induction furnace or flash welder connected to the system in the vicinity should be noted, giving its type and rating.

Factory Insulation Tests

The test potentials should be specified to be at least as great as follows:

Capacitor Rated Voltage	(a) Between Short-Circuited Terminals and Ground Volts for 1 Min.	(b) Between Terminals Volts for 1 Min.
240	3,000	500
480	5,000	1,000
600	5,000	1,200
2,400	10,000	5,000
4,160	15,000	9,000
4,800	15,000	10,000
7,200	17,500	15,000

These tests should be required of every unit. Should the manufacturer prefer, it may be permissible to waive test (b), providing that every unit be subjected to a potential between terminals of 150 per cent of rated voltage for 24 hours.

Insulation tests of higher potentials may infrequently be necessary for units

requiring a higher factor of safety, such as for those used for generator protection, harmonic suppressors, etc.

It is important that the manufacturer's proposition include specific information regarding temperature rise, losses, thermal capacity, etc., as well as a general description of the equipment in order that consideration may be given to the purchase of the equipment on a merit basis.

It is important that the manufacturer recognize the provisions in the purchase inquiry as binding, and state that he is quoting in accordance with its provisions unless definite exceptions are indicated.

Special information desired, such as available space on racks for the addition of future units, description of special auxiliary equipment, etc., should also be obtained when required.

Building Foreman

(Continued from page 356)

completely unfolds the fundamental causes, many of which immediately suggest remedies to the foremen. He periodically publishes accident reports, showing the relative standing of foremen, the number of men under each, hours worked, lost time accidents, days lost, the fundamental causes and total cost. He helps the foreman with safety meetings of employees, counsels with him concerning safety committees, advises on all phases of accident prevention work, but carefully avoids assuming any of the duties rightfully the function of the foreman, such as actual regular inspections, the issuance of specific instructions to workmen, training them in safe habits and exercising disciplinary measures. He continually reflects to the foreman that accidents are not inherent in the operation of the business; that they can be controlled and their prevention is just as vital a part of the foreman's duties as any other phase of his work.

What is the psychology of this type of continued, driving interest in accident prevention reflected by the department head and the safety engineer? What is the foreman's reaction? He is sold on it; he is convinced without any doubt left in his mind, that the boss means business. He knows an accident doesn't just happen; that there is a fundamental, preventable reason behind its occurrence. He definitely recognizes that his company holds him responsible, not only for getting the job done efficiently, but getting it done without injury or the waste of money caused by a preventable accident.

Suggested Form for Purchase Inquiry

CAPACITOR—STATIC CONDENSER

....
Company Address

Manufacturer..... Inquiry No.....
Office..... Date.....
No. of Complete Units..... Job.....
Delivery Required .....

TYPE AND RATING

Kva..... Phase..... Cycles..... ..... Operating Voltage.....
Outdoor or Indoor..... Frame, Floor or Pole Mounting.....
Self-Cooled, Ambient Temperature 40° C.

PARTICULAR REQUIREMENTS

Switching equipment (is) (not) desired, and should consist of.....
.....
.....
Protective equipment should consist of.....
.....
.....
Auxiliary equipment .....
.....
.....

PROPOSED OPERATING CONDITIONS

The static condenser is to be normally connected on the (low tension) (high tension) side of a transformer bank consisting of.....(single) (three) phase transformers each rated .....kva, and connected.....volts (delta) (wye) (.....) to..... volts (delta) (wye) (.....) and having a reactance of.....% at rating.
The short-circuit duty will be approx. .....amps. at.....volts. The actual voltage at the point of connection of the condenser will usually be approximately.....volts. The maximum actual voltage sustained for periods of one-half hour or more will normally not exceed .....volts without the condenser in service. It is calculated that this value may be increased to.....volts with the condenser in service and at light load.
.....
.....
.....
.....

The manufacturer shall carefully review the data given above and shall submit his comments thereon and advise as to whether resonance or similar undesirable operating conditions may be expected. If so, it is requested that the manufacturer furnish a complete description of mitigating equipment required. It is understood that the manufacturer cannot guarantee that resonance will not occasionally be experienced even when calculations might indicate otherwise.

FACTORY TESTS

Three copies of a certified statement by the manufacturer that each complete unit has successfully withstood the following routine tests shall be sent to.....
.....
within 15 days after completion of the tests.

Tests shall be made in accordance with the latest A.I.E.E. Standards, except as may be modified herein, with each unit completely assembled in its own case. These tests shall include:

Insulation Tests

(a) A potential of at least.....volts, at 25 to 60 cycles, shall be applied to each completed unit between short circuited terminals and ground for one minute.
(b) A potential of at least.....volts, at 25 to 60 cycles, shall be applied between terminals of each completed unit for one minute.

Dielectric Loss Tests

(a) The dielectric loss shall be measured on each completed unit when operated at rated kva, rated voltage and rated frequency.

GUARANTEE

The manufacturer shall guarantee that each condenser unit and its associated equipment will be in accordance with the provisions contained in this inquiry, and in accordance with the latest A.I.E.E. standards, in so far as may be consistent with the requirements of this inquiry, in all respects not excepted in the manufacturer's proposition.

MANUFACTURER'S PROPOSAL

Manufacturer's proposition should be sent to.....
..... prior to .....

Manufacturer's propositions should be in triplicate and contain the following:

(a) Guarantee.
(b) List of exceptions to inquiry.
(c) Guaranteed temperature rise when operated at rating.
(d) Guaranteed losses—watts per kva—when operated at rating and with an ambient temperature of 40° C.
(e) Maximum continuous operating voltage.
(f) Thermal ability—the maximum continuous permissible rms amperes when operated at the maximum continuous operating voltage.
(g) Size and type of fuses. State whether fuses are internal or external.
(h) Complete description of design and construction, including associated and auxiliary equipment required.
(i) Approximate dimensions of assembled equipment.
(j) Approximate shipping weight.
(k) Delivery promise.
(l) Cost f.o.b. factory.
(m) Cost f.o.b. .....
(n) Cost per unit of spare condensers, f.o.b. factory.

DRAWINGS

..... copies of each of the following drawings shall be sent to.....
..... as soon as possible after receipt of order for equipment:
Outline, Instruction Book, Wiring Diagram.

Prepared by..... Date..... Inquiry No. .....

Situations in Which Federal Commissions May Make Rules and Regulations Under the Public Utility Act of 1935

Abstracted by Martin V. Callagy

Under the provisions of the Public Utility Act of 1935, the Securities and Exchange Commission and the Federal Power Commission are authorized, in many situations, to make rules and regulations governing certain functions of holding companies, their subsidiaries, and operating companies subject to the Act. The discretion allowed the Commission in this respect is of primary concern since the effect of what the Commission may prescribe may be as detrimental as many of the requirements written in the Act itself, and, at least, add considerable expense and consume valuable time which under usual conditions would be given to the administration of company affairs. The situations and instances wherein the two Commissions have authority to make rules and regulations have been abstracted and are listed below.

I—The Securities and Exchange Commission under Title I may make rules and regulations in the following instances:

1. Sec. 2, subs. a No. 3—Where specified class or classes of companies are declared not to be electric utility companies.

2. Sec. 3, subs. a No. 4—Where specified class or classes of companies are declared not to be gas utility companies.

3, Sec. 3, subs. a—When exempting holding company and subsidiary companies from provisions of Title I.

4. Sec. 3, subs. b—When exempting subsidiary companies of holding companies from the provisions of Title I.

5. Sec. 4, subs. d—When exempting any specified class or classes of persons from the obligations or liabilities imposed on subsidiaries or affiliates under Title I.

6. Sec. 5, subs. a—Form may be prescribed to be used by holding company in registering.

7. Sec. 5, subs. b et seq.—The time for filing form to be used, and data to be included in filing registration statement by holding company.

8. Sec. 5, subs. c—In connection with preliminary registration statement and time for filing complete registration statement.

9. Sec. 6, subs. b—When exemption of securities of registered holding companies is sought and where an exempted security is to be issued, a certificate of notification is to be filed as prescribed.

10. Sec. 7, subs. a—Where declaration is filed concerning acts otherwise prohibited regarding security sales.

11. Sec. 7, subs. a No. 1—A declaration regarding security transactions shall include information filed under the Securities Act of 1933, in connection with the registration of a security, as the Commission prescribes.

12. Sec. 7, subs. b—Prescribing time in which security declaration becomes effective.

13. Sec. 7, subs. c No. 1—Regarding assets necessary as security before a declaration regarding the issue or sale of a security may become effective.

14. Sec. 7, subs. c No. 3—A declaration regarding the issue or sale of a security may become effective where the Commission, by rules and regulations, authorize the security as being necessary in the public interest.

15. Sec. 9, subs. c No. 2—Prohibitions regarding acquisition of securities do not apply to readily marketable securities within amounts as Commission prescribes.

16. Sec. 9, subs. c No. 3—Prohibitions regarding acquisition of securities do not apply to commercial paper within amounts as Commission prescribes.

17. Sec. 10 (a)—Applications for approval of acquisition of securities and assets is to be in such form as Commission prescribes.

18. Sec. 10, subs. a No. 1—In acquisition of securities, application for permission to acquire must include information and copies of documents as Commission prescribes.

19. Sec. 10, subs. a No. 1 G—Application for acquisition of securities and utility assets is to include balance sheets and profit and loss statements for five years back as Commission prescribes.

20. Sec. 10, subs. a No. 2—Application for approval of acquisition of utility assets must include data as Commission prescribes.

21. Sec. 10, subs. a No. 3—Application for approval of acquisition of any interest in any business to include information as Commission prescribes.

22. Sec. 10, subs. d—Order approving acquisition of securities or utility assets shall be within such reasonable time as prescribed.

23. Sec. 11, subs. d—Reorganization plan may be proposed by person in interest (defined by Commission rules and regulations) pursuant to rules and regulations.

24. Sec. 11, subs. e—Holding company or subsidiary to submit plans for reorganization in the public interest and in interest of investors and consumers as prescribed.

25. Sec. 11, subs. f—Rules and regulations regarding persons in interest submitting plan for reorganization.

26. Sec. 12, subs. b—Holding companies or subsidiaries not to lend money or credit in contravention of rules and regulations.

27. Sec. 12, subs. c—Holding company or subsidiary not to pay dividends or retire or redeem securities in contravention of rules and regulations.

28. Sec. 12, subs. d—Holding company or subsidiary not to sell any security in contravention of rules and regulations.

29. Sec. 12, subs. e—Solicitation of proxies or power of attorney regarding securities not to be done in contravention of rules and regulations.

30. Sec. 12, subs, f—Holding company or subsidiary to have no transaction, not otherwise unlawful, with company in the same system in contravention of rules and regulations.

31. Sec. 12, subs. g—Affiliate not to engage in transaction not otherwise unlawful in contravention of rules and regulations.

32. Sec. 12, subs. i—Advocating or opposing measure before Congress or Federal Power Commission or Securities Exchange Commission unlawful unless statement filed before Commission as prescribed.

33. Sec. 13, subs. a—Exemption from prohibition on service, sales and construction contracts, where special or unusual circumstances involved, pursuant to rules and regulations.

34. Sec. 13, subs. b—When allowing subsidiaries to perform service, sales and construction contracts otherwise prohibited.

35. Sec. 13, subs. f—General rules and regulations for persons performing service sales or construction contracts, for public utility or holding companies.

36. Sec. 14—Holding companies and mutual service companies in making reports are to answer inquiries by Commission as prescribed and if so ordered, such reports are to be certified.

37. Sec. 15, subs. i—General rules and regulations for persons filing reports including uniform accounts and accounting methods.

38. Sec. 17, subs. c—Exemption from prohibition on banking officials and utility officials being identical, allowed as prescribed by rules and regulations.

39. Sec. 20—This section deals generally with rules and regulations applying to accounting, declarations, reports, balance sheets, profit and loss statements, and other accounts, the manner of showing costs, etc., where the accounts of a company are being kept pursuant to a law of the United States or of a State, the Commission's rules and regulations respecting the company's accounts shall not be inconsistent with already existing requirements.

II — The Federal Power Commission may prescribe rules and regulations under Title II, "Amendments to Federal Water Power Act," in the following instances:

40, Sec. 206 (Sec. 10 c)—Licensees to maintain works in accordance with the rules and

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Commercial News Notes

By C. E. Greenwood
Commercial Director, Edison Electric Institute

THE energy output per domestic customer is now approximately 650 kilowatt hours, an increase of 5.5 per cent over last year. The trend is sharply upward as the value of promotion and selling to the economic health of the utility is fully realized. The increase is encouraging though comparatively small. When we recall that one company raised its average energy output for homes by approximately 200 kilowatt hours in one year, we have a forecast of what intensified selling can do. More power to the Commercial Departments.

WHILE we are keeping vigorous selling pressure on the domestic consumer and are keenly watchful of competition in the industrial field let us not keep too far in the background the small commercial customer — the small merchant, restaurant, beauty parlor and other prospective customers for many dollars worth of electric equipment for useful services. A survey of this field will convince the commercial executive that he has rich potentialities in this group for heating, cooking, ventilating, air conditioning and small power devices.

Give this group the once-over and boost commercial revenue.

THE production of the 4-reel sound film "The Courage of Kay"—an intriguing story built around electric kitchen modernizing and tied in with Federal Housing activities — has been completed. It is peppered with some commercial advertising, but not in any way to irritate those who view the picture. The film is "Sponsored by Edison Electric Institute and a group of industrial companies cooperating with Federal Housing Administration."

An entire Hollywood cast is headed by Lois Wilson and Lloyd Hughes, widely known in filmdom. The scenario is by Philip Hurn who wrote "Wings in the Dark." A private showing has been given in New York and the first public showing is at the Western Washington Fair, Seattle, Washington, attended last year by approximately 75,000 people. It should be shown in your town. Write to the Commercial Department for further information.

Kitchen Modernizing Bureau

WHICH is a reminder that George E. Whitwell, Vice - President, Philadelphia Electric Company, and Chairman of the newly formed Electric Kitchen Modernizing Bureau, is to call an organization meeting shortly. The raising of a national manufacturer promotional fund is nearing the quota for the first year.

R. E. Barnes, formerly Assistant to the President of West Penn Electric Company, has joined the Commercial staff at Headquarters and will administer the Kitchen Modernizing Program.

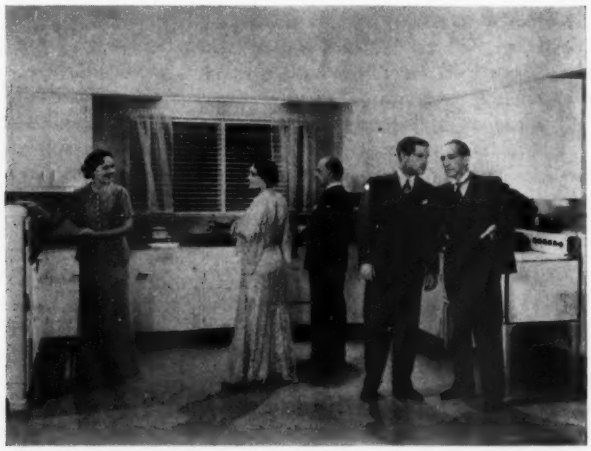
AS the BULLETIN goes to press, Chairman H. P. J. Steinmetz of the Sales Committee is holding a meeting at The Greenbrier, White Sulphur Springs, in advance of the conference of Sales Managers' Association. Committee organizations will be completed and programs outlined.

W. H. Sammis, former Chairman of the Industrial Power and Heating Committee, has been obliged to relinquish his special duties and is succeeded by L. L. Bailey, Commercial Manager of Monongahela West Penn Power Company.

The Report of the Air Conditioning Committee for 1935, C. E. Michel, Chairman, is just off the press. As usual it contains authentic data on performance and numerous examples of manufacturer cooperation in sales and promotional campaigns with the utility company.

The Lighting Sales Committee, Julius Daniels, Chairman, has outlined a commercial lighting activity jointly with a group of reflector manufacturers. A prospectus has been placed in the mail for all commercial executives and lighting service men. There has been made available a set of four-page illustrated letterheads with multigraphed letters for utility mailing. Here is opportunity for focusing attention on the need of better commercial lighting and at the same time increase revenue.

J. D. Noyes, Chairman of the Wiring Committee, has assigned to E. A. Brand of Buffalo, the important task of organizing an industry committee to prepare a Handbook of Interior Wiring Design. It will be recalled that Mr. Brand headed the Joint Industry Committee that prepared the Adequacy



Old Kitchens and New—Two Scenes from "The Courage of Kay"

Specifications for Wiring in Residences and Apartments which has been widely circulated and adopted.

Serving on this Committee, sponsored by the Institute, are representatives of the National Electrical Contractors Association, National Electrical Manufacturers Association, National Electrical Wholesalers Association, International Association of Electrical Inspectors and Illuminating Engineering Society.

The Committee is a highly competent one, and we may be confident that out of its deliberations will be developed a Handbook both authoritative and useful to the industry.

Better Light-Better Sight

THE education and social objectives of the Better Light-Better Sight Program, M. E. Skinner, Niagara Hudson Power Corporation, Chairman, are being continuously emphasized as well as the incidental commercial phases. Better Sight Bureaus and Sight Saving Councils are being organized locally for cooperative educational activity with the optical industry.

The list of lamp manufacturers meeting the specifications for Better Sight lamps is rapidly growing. Over six hundred thousand lamps have been sold to date. Interest in improved illuminating for the preservation of vision moves apace.

Electrical Housewares

THE August issue of *Electrical Housewares* announces National Electrical Housewares Week December 2-7 as a feature of this joint effort of Edison Electric Institute and cooperating manufacturers of electric appliances. The National Committee is preparing a Christmas poster which will be distributed to dealers of all classes in November. There will be a contest feature with $600 in prizes built around window and interior store displays using this poster during Housewares Week.

The third quarter contest for excellence in interior and window store displays closes on September 30.

Electric Water Systems Council

HAVE you ordered your Broadsides for mailings to your prospects for electric water systems? The government Rural Electrification Program places running water as a leading necessity in rural and semi-rural homes. Many financing arrangements make it easier to buy electric water systems. The Broadsides prepared by the Electric Water Systems Council broadcast an effective message. The cost is low—only $19.50 per thousand.

The Electric Water Systems Council of which P. H. Powers, West Penn Power Company, is Chairman, is a joint effort between the pump manufacturers and representatives of Edison Electric Institute to double the rate of sale of electric water systems. It is nearing its objective. It is expected that approximately 105,000 units will be sold this year.

First Meeting of Joint Industry Committee to Prepare Handbook of Interior Wiring Design

GROUNDWORK for preparation and promotion of a Handbook of Interior Wiring Design for architects, consulting engineers, general and electrical contractors and others was laid at the first meeting of a joint Industry Committee, Aug. 14, at New York.

Organization of the Joint Industry Committee was at the invitation of the Edison Electric Institute Sales Committee, and Mr. Edward A. Brand of Buffalo was chosen permanent chairman. A second meeting will be held about the middle of September. It is expected that the work will take all winter.

Appointment of a technical subcommittee to prepare the detailed design and specific data, and assignment of other parts of the Handbook, which has been developed in outline, marked the initial meeting. It was tentatively decided that the various organizations represented in preparing the pamphlet would underwrite its printing.

Basis of the work will be the Adequacy Wiring Standards for Residence Buildings developed in 1931 by a group similar to the present committee, together with the Minimum Specification for Adequate Wiring of Lighting Circuits in Commercial and Public Structures, and the Minimum Specification for Adequate Wiring in Industrial Structures prepared by committees of the old N.E.L.A.

Use of these documents in the field has indicated that they could be made more valuable and have a wider application if certain explanatory material were prepared to interpret the standards for the specification writer and indicating to architects, engineers and others how to apply them to any specific job.

The Handbook will also have a section on the need for and advantages of adequate wiring, intended to sell the value and use of the standards to groups to which they are directed.

Trade associations and their representatives on the committee are:

AMERICAN INSTITUTE OF ARCHITECTS: David B. Crane, Secretary, Buffalo Chapter, 1 Niagara Square, Buffalo, N. Y.; John J. Wade, 250 Delaware Avenue, Buffalo, N. Y.

ARTISTIC LIGHTING EQUIPMENT ASSOCIATION: George Ainsworth, 242 East Thirty-seventh Street, New York City; Kenneth Curtis, Curtis Lighting, Inc., 1123 West Jackson Boulevard, Chicago.

EDISON ELECTRIC INSTITUTE: S. W. Thompson, Commonwealth Edison Company, 72 West Adams Street, Chicago, Ill.; E. A. Brand, Niagara Hudson Power Corporation, 600 Electric Building, Buffalo, N. Y.

ILLUMINATING ENGINEERING SOCIETY: Max Gysi, Brooklyn Edison Company, 380 Pearl Street, Brooklyn, N. Y.; R. G. Slauer, Westinghouse Lamp Company, Bloomfield, N. J.

INTERNATIONAL ASSOCIATION OF ELECTRICAL INSPECTORS: F. N. M. Squires, New York Board of Fire Underwriters, 85 John Street, New York City; R. B. Ward, Electrical Bureau, City Hall, Newark, N. J.

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION: *Robert A. Goeller, Hatzel and Buehler, Inc., New York City; *George H. McKee, G. H. McKee, Inc., Mount Vernon, N. Y.; Charles D. White, J. R. DeMott, Inc., Paterson, N. J.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION: *L. F. Adams, General Electric Company, Schenectady, N. Y.; *Frank Thornton, Jr., Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.; C. A. Bates, Bryant Electric Company, Bridgeport, Conn.; F. C. Hodkinson, American Circular Loom Company, 233 Broadway, New York City; H. J. Mauger, Edison G. E. Appliance Company, 5600 West Taylor Street, Chicago, Ill.; H. H. Weber, United States Rubber Products, Inc., 1790 Broadway, New York.

NATIONAL ELECTRICAL WHOLESALERS ASSOCIATION: E. A. Hawkins, Graybar Electric Company, 420 Lexington Avenue, New York City.

* Voting representatives.

Better Light-Better Sight Forges Ahead

National Bureau Holds Second Annual Meeting

OFFICIAL delegates and representatives of fifteen national associations and organizations sponsoring the National Better Light-Better Sight Bureau held their second annual meeting on August 8th at the Harvard Club, New York City.

The Chairman of the Bureau, M. E. Skinner, and M. J. Julian, Vice Chairman, were both re-elected and G. R. Trumbull was reappointed Manager-Secretary. The Executive Committee, appointed by the Chairman, includes Messrs. C. E. Greenwood, H. F. Barnes, H. P. J. Steinmetz, J. F. O'Brien, M. J. Julian and M. E. Skinner.

Following the opening address by the Chairman, the report of the Manager detailing the operations of the Bureau during the past year, including rate of progress, public interest and acceptance and financial details, was presented. The meeting then became a forum for expressions and reports of the delegates covering their respective association or organization operations during the year and an outline of plans for the coming year.

What Has Been Accomplished

Among the more tangible activities and accomplishments of the Better Light-Better Sight activity last year it was reported that:

In over 90 per cent of the cities of the country with a population of 10,000 or more some kind of a Better Light-Better Sight activity was carried on.

At the end of the year more than 5,000 persons on utility staffs alone were devoting their full time to selling better seeing in homes, stores and factories. Fully 60 per cent of these were added during the past year.

In the combined electrical, paint and optical industries it is estimated that over 275,000 persons were doing something in connection with their daily work to promote eyesight conservation and Better Light for Better Sight.

At the end of the year over 100 Sight Saving Councils, Better Sight Bureaus or equivalent local cooperative groups had been organized in small communities and important cities throughout the country, and all signs point to a substantial number being formed during the coming year.

Meetings and educational gatherings held within participating organizations during the past year total more than 6,000 with a total attendance estimated at 500,000.

More than 22,000 small light measuring meters are reported to be in use at the end of the year and they are continuing to be sold at a rapid rate.

Use of better seeing kits and demonstrators by trained Better Sight salesmen is growing tremendously. It is known that approximately 3,500 sets of this equipment have been sold in the last year to utilities alone by three electrical manufacturers. Hundreds of others, home made, have been put in use.

Reliable sources estimate conservatively that over 6,000,000 column inches of newspaper advertising was used last year on Better Light-Better Sight. This advertising appeared in every important city in the United States and in a large percentage of cities and towns over 3,000 population, and represents approximately 180,000 newspaper advertisements to a circulation of over 40,000,000. Over 185 pages of trade paper advertising were run in electrical, paint and optical publications.

In over 20 of the leading national magazines, one or more page advertisements have been run to a circulation of over 20,000,000.

Over 5,000,000 column inches of editorial articles appeared in national magazines and local newspapers throughout the country.

Over 50 radio stations electric utilities alone broadcast the Better Light-Better Sight message to millions of listeners through many programs.

Over 17,000,000 pieces of direct mail material of various kinds are estimated to have been mailed and distributed by members of the electrical, optical and paint industries.

Over 125,000 window and display cards of many designs and sizes have been used by members of these three groups.

The bulletins and house organs of a large number of organizations within these three industries have regularly carried inspirational messages to employees and to thousands of outsiders.

In commenting on the work of the Bureau, Chairman Skinner said:

"If I were asked which were the most significant accomplishments, I would be inclined to say that the change in public attitude brought about in our first year was by all odds the most important accomplishment. That is, of course, the fundamental objective of the Bureau—to increase public consciousness in the importance of Better Light for Better Sight. In so doing, we are all aware of the business benefits which must accrue. Indications of the extent to which we have influenced public thinking are numerous. One of these is in the change in attitude of department stores toward the program and particularly toward the sale of certified Better Sight lamps.

"At the Lamp Market in January only a limited number of Better Sight lamps were displayed by the manufacturers and the department store buyers had little interest in these models. The interest which they did exhibit was mostly a critical one. Six months later at the lamp markets in Chicago and New York the manufacturers were amazed to discover that most department store buyers were definitely building their Fall programs around this merchandise and, in some instances, were insistent that they would buy no merchandise unless it were certified. We all know that the department store is primarily interested in catering to a public demand and I think the change in attitude of the department store lamp buyers directly reflected the increased public interest in Better Sight lamps.

"Another evidence is the attitude of the medical profession and of public authorities. They were extremely critical of some of the mistakes which we made in our early enthusiasm, but those who are deeply interested in eye conservation are now cooperating in many ways, for they recognize the powerful agency which the movement can be for arousing public interest. Due to the commercial nature of our activity, it can marshal forces which are infinitely more powerful than those which are available to welfare and professional organizations which must depend entirely upon volunteer effort.

"Still another evidence is the splendid cooperation which we have been receiving in increasing measure from the Better Vision Institute. Mr. Julian in speaking at the Atlantic City Convention of the E.E.I. said frankly that for a time they watched our activity with some suspicion, but that intimate contact with the program and with the philosophy back of it convinced them that it was in their interest to join wholeheartedly in our program.

"Mr. Trumbull's report indicates the extent to which sales power has been increased in utility organizations and I think we must all agree that a bunch of hard-headed utility executives operating under the handicaps and with the problems which beset them today would not add to their personnel to the extent indicated unless they were reasonably

well satisfied that the activity was a permanent, profitable and beneficial one.

"When we met a year ago some of the organizations which were represented had difficulty in picturing the benefits which would accrue to their membership and, for that reason, adopted a waiting attitude. Within the last few months most of these organizations have taken active steps to center the attention of their membership on the program and to capitalize on opportunities which they now see clearly."

In his report, Manager Trumbull said, in part:

"The first year's operations of the National Better Light-Better Sight Bureau is a record of substantial progress and real accomplishments. Not only progress in the development of nation-wide interest in the educational and social objectives of the Bureau, namely, Better Light-Better Sight for Better Living, but material commercial gains have resulted for those sponsoring groups and associations most actively engaged in promoting the movement nationally and locally.

"Associations and organizations within the electrical, optical and paint industries have been the prime movers in the movement to date.

"The electric utilities by virtue of numbers and wide coverage of the country have been the initiators of local programs quite generally and the greatest contributors of financial support, sales power and sales promotion behind local activities.

"Scattering at first, but gaining momentum steadily, the interest and active participation of the optical fraternity is forging ahead over the country at a rate rapidly approaching the magnitude and extent of endeavors of the utilities. Wherever this combination of utility and optical groups have joined forces and are actively cooperating, the greatest progress and success are resulting.

"Backing these two important groups are the initiative, resources and continuous stimulation of a few of the electrical organizations, notably the large Mazda Lamp Manufacturers.

"The paint and decorating industry is likewise gaining in appreciation of not only the human welfare angle but in the more tangible commercial possibilities.

"Probably the best indication of the permanency of the movement has been the growth of Better Sight Bureaus, Sight Saving Councils or equivalent co-operative organizations over the country during the past year.

"On August 1, 1934, the very day that the National Better Light-Better Sight Bureau was formally organized, the first Sight Saving Council, embodying the fundamentals and principles of the National Better Light-Better Sight Program, was formed in Cleveland. As of April 1, 1935, the number of local cooperative organizations had grown to a total of 86, with 34 in the process of formation.

"These groups are in cities ranging from a few thousand population to the large metropolitan centers and cover 36 states, indicating the broad acceptance of the cooperative method and the unity of interest. One Bureau, probably the largest in point of area, covers parts of three states and a large number of cities, all close enough and with uniform local policies to assure a workable and effective organization. Many of these Councils are an outgrowth of former eyesight conservation groups originally confined to the local optical interests."

Mr. T. J. Maloney, representing M. J. Julian, President of the Better Vision Institute, presented a brief picture of how the Better Vision Institute is furthering the Better Light-Better Sight movement. "As of August 1st," he said, "the Institute will have placed approximately 1600 copies of the light-prescribing technique in the hands of optical practitioners and salesmen. Practically every salesman of every worthwhile optical jobber in the country will have this technique in his hands together with a complete selling story. Furthermore, he will have the urge of his employer to push it.

"The project on light prescribing is getting full publicity support. Through its newspaper, radio and magazine influences, the Institute will carry this story of light prescribing. Good Housekeeping Magazine and Parent-Teachers Magazine will be among the first national magazines to feature this story. Other publications will likewise feature it. Similarly, the idea of light prescribing is being injected into newspaper releases and also into radio records. The Institute will soon release a miniature edition of the light-prescribing technique which will be addressed to consumers. It will be distributed by our optical retailers as well as by utility companies. The main emphasis will be on light.

"As a next step in the Institute's program to put over light prescribing, the two series of utility advertisements were introduced. The major purpose is to build acceptance for the idea of better lighting, to build prestige for the optical practitioner, and to send consumers into the eyesight specialists' offices where the public will accept lighting recommendations with least opposition.

"As a third tie-in with the campaign the Institute is working on a plan which will make available its extensive radio program to this campaign. In other words, 200 stations now using Institute releases will be enlisted to support the newspaper effort. The recordings which the Institute is to release to them will be tuned and timed to the newspaper series."

Mr. R. W. Emerson, Executive Secretary of the National Paint Up Clean Up Bureau, said: "The National Clean Up and Paint Up Campaign Bureau is very definitely promoting the Better Light-Better Sight idea, through various means, in the thousands of local Clean Up and Paint Up Campaigns which are inspired annually in the United States. For example, the Bureau has a special set of newspaper mats in which the relationship of modern lighting and modern painting constitutes the theme. These are being made available without charge to newspapers throughout the country, in the Bureau's regular newspaper mat service. In many of the important campaigns, the term 'Light Up' has been added, and made an important factor in the welfare work of the campaign. The idea is woven right into the character of the young people of the nation to such a definite degree that the students in the schools put in many hours of their time preparing posters and essays based upon the factors in the campaign, including Better Lighting.

"The success of the National Clean Up and Paint Up Campaign is due to its recognition of and practice of altruistic principles, and the most successful achievement of the Better Light-Better Sight Bureau will be due to following out the same principles."

Mr. C. E. Greenwood, Commercial Director of the E.E.I., told the meeting that during the past ten years the Edison Electric Institute and its predecessor Association have never participated in a movement in which the elements of human welfare were more closely tied in with the commercial phases as in this Better Light-Better Sight activity. "We have sold previously better light in industry to promote better products and better performance of the employees,

and in stores for the better display of merchandise," said Mr. Greenwood. "But we have never gone into the home to express a more potent need for more light and to impress the importance of the quality of light as we are doing now to protect vision. We are really making some contribution in helping our friend Mr. Carris, who represents the Society for the Prevention of Blindness. There has been a fine blending of light and sight for preservation of vision."

Mr. P. S. Millar, President, Electrical Testing Laboratories, said: "As I listened to the review of accomplishments within a year, and to statements of expected accomplishments during the coming year, and also to announcement of the programs of the optical and paint industries in relation thereto, I was tremendously impressed with the success of this movement. I thought of the many years during which some of us in the Illuminating Engineering Society have been studying the problem of illumination, gradually uncovering the fundamentals of the art, and seeking to bring about application in lighting practice. But always we have been discouraged to realize that ideals in lighting far outstripped general practice and that available knowledge on lighting principles too often was not reflected in lighting practice. Then the IES study lamp was evolved; specifications for it were formulated by the Illuminating Engineering Society; numerous manufacturers began to produce such lamps; and the National Better Light-Better Sight Bureau, then in its formative stage, took the movement under its wing and supplied the commercial promotion without which it could never have attained to present proportions and sales. Thus for the first time in a large way the public is being given a practical demonstration of the potentialities of good lighting with portable lamps. The public is accepting it with acclaim and indirectly there is being created an influence which seems bound to result in better lighting practice generally. And the dream of illuminating engineers is materializing under the influence of the National Better Light-Better Sight Bureau."

Mr. L. Kalischer, representing the National Electrical Contractors Association in the absence of Lawrence Davis, National Director, remarked: "You are guiding the people in a most effective manner in safeguarding their eyesight, the greatest stake a human being ever contended for. We cannot buy eyes, but we can and with the Bureau's help do re-

ELECTRIC REFIGERATOR SALES

(Household Models Only)

MONTH OF JULY AND FIRST SIX MONTHS OF 1935

	July, 1935	July, 1934	June, 1935	First Six Months, 1935	First Six Months, 1934
Total United States	*154,121*	*120,846*	*161,525*	*1,105,579*	*1,003,574*
Maine	1,004	642	936	5,702	5,163
New Hampshire	637	476	759	4,139	3,388
Vermont	463	255	466	2,527	2,002
Massachusetts	6,673	5,069	7,038	42,986	37,210
Rhode Island	809	552	958	5,524	5,957
Connecticut	3,109	1,530	2,211	15,360	13,685
Total New England	12,695	8,524	12,368	76,238	67,405
New York	20,471	17,349	20,009	110,875	128,009
New Jersey	6,717	5,093	7,890	45,739	43,100
Pennsylvania	12,932	9,781	12,587	84,101	94,875
Total Middle Atlantic	40,120	32,223	40,486	240,715	265,984
Ohio	10,002	7,538	9,490	74,113	70,359
Indiana	4,401	3,152	4,202	27,862	26,539
Illinois	10,670	6,740	12,381	119,665	74,348
Michigan	5,540	3,363	5,677	45,179	40,856
Wisconsin	2,273	1,210	2,326	18,611	17,300
Total East No. Central	32,886	22,003	34,076	285,430	229,402
Minnesota	2,743	911	1,643	16,518	14,298
Iowa	2,308	1,369	2,530	19,109	17,022
Missouri	4,496	5,185	3,745	34,824	40,540
North Dakota	400	146	496	3,163	2,670
South Dakota	564	251	607	3,970	3,468
Nebraska	1,491	1,007	1,627	13,090	12,213
Kansas	1,892	1,748	1,938	15,095	16,656
Total West No. Central	13,894	10,617	12,586	105,769	106,867
Delaware	340	257	338	2,472	2,349
Maryland	1,991	2,274	2,478	16,280	19,254
Dist. of Columbia	1,309	1,140	1,143	8,547	9,640
Virginia	2,329	2,250	2,301	16,890	16,910
West Virginia	1,777	1,726	1,896	12,056	14,751
North Carolina	1,900	1,663	2,253	21,681	17,089
South Carolina	1,442	1,473	1,340	9,955	7,139
Georgia	3,251	6,867	4,038	20,815	16,902
Florida	2,419	2,087	2,471	14,987	8,216
Total South Atlantic	16,758	19,737	18,258	123,683	112,250
Kentucky	1,858	2,201	1,889	12,904	15,130
Tennessee	2,169	5,827	1,966	19,205	17,711
Alabama	1,619	1,682	2,367	18,148	11,953
Mississippi	670	885	638	5,618	3,318
Total East So. Central	6,316	10,595	6,860	55,875	48,112
Arkansas	911	935	1,067	8,067	6,846
Louisiana	1,399	1,387	1,291	11,020	6,873
Oklahoma	1,466	1,296	1,487	13,982	14,791
Texas	5,101	4,170	6,331	48,633	39,880
Total West So. Central	8,877	7,788	10,176	81,702	68,390
Montana	826	313	832	4,586	4,309
Idaho	716	186	1,147	5,536	3,665
Wyoming	318	138	344	1,887	1,856
Colorado	1,563	881	1,560	8,845	8,397
New Mexico	326	235	491	2,828	1,992
Arizona	410	269	756	4,739	2,801
Utah	523	368	1,486	6,087	4,955
Nevada	262	94	355	1,349	939
Total Mountain	4,944	2,484	6,971	35,857	28,914
Washington	1,967	1,313	2,262	15,814	15,187
Oregon	1,656	514	2,240	10,981	13,440
California	14,008	5,048	15,242	73,515	47,623
Total Pacific	17,631	6,875	19,744	100,310	76,250

Figures based on Report Issued by the National Electric Manufacturers Association.

move many of the causes that result in their impairment. The physical comfort and well being are so closely allied with good eyesight that the resultant commercial advantage cannot be calculated."

Mr. Frank Ryan, Assistant to the President of the Cleveland Electric Illuminating Co., commented on the operations and objectives of the Cleveland Sight Saving Council. He emphasized that the organizers believe that the greatest success and most good could be accomplished by confining the local activity to a strictly educational program. He stated in his belief the commercial interests would automatically participate as progress is made in education of the public to eye care and better seeing conditions.

Federal Commissions May Make Rules and Regulations

(Continued from page 362)

regulations of the Commission for the protection of life and health and property.

41. Sec. 209 (Sec. 18)—The operation of any navigation facilities constructed in connection with a dam are to be controlled by rules and regulations of Secretary of War.

Part II—Regulation of Electric Utility Companies Engaged in Interstate Commerce.

42. Sec. 204, subs. c—When public utility issues or renews or assumes liability on a note or draft, statement is to be filed in form and containing such matters as by regulation is required.

43. Sec. 205, subs. a—Rules and regulations made by Commission which affect rates or charges are to be reasonable.

44. Sec. 205, subs. c—Schedules of charges and rates are to be filed with the Commission as prescribed.

45. Sec. 209, subs. a—Procedure of board appointed by Commission and to which matters are referred is to be in accordance with Commission regulation.

46. Sec. 209, subs. b—Joint hearings with State Commissions, where Commission is authorized to act, shall be in accordance with rules and regulations.

Part III—Licensees and Public Utilities, Procedural and Administrative Provisions.

47. Sec. 301, subs. a—Licensees and public utilities to keep accounts according to Commission rules.

48. Sec. 302—Depreciation to be carried as prescribed.

49. Sec. 304, subs. a—Every licensee and public utility to file reports as prescribed.

50. Sec. 308, subs. a—Those interested may be admitted as parties to a hearing in accordance with Commission rules and regulations.

Prize Award Competitions for 1936 Are Announced

MR. FRANK W. SMITH, Chairman of the Prize Awards Committee of the Institute, has announced the several prizes and awards to be administered by the Edison Electric Institute for the year 1936. The Byllesby, Forbes, Lindemann and McGraw Prizes are again offered by their respective donors for papers on subjects relating to the Electric Light and Power Industry. The prizes to companies and individuals for accomplishments in specified activities are the Charles A. Coffin Award, the Hughes Award, the Martin Award and the Augustus D. Curtis Award.

The Prizes offered to individuals are:

BYLLESBY PRIZE—Accounting

Cash prizes of $100, $50 and $25 donated by Byllesby Engineering and Management Corporation, in memory of Colonel H. M. Byllesby, for the three most meritorious papers on any Accounting subject relating to the Electric Light and Power Industry.

FORBES PRIZE—Public Relations

A cash award of $250 donated by Mr. B. C. Forbes, Editor, Forbes Magazine, for the most meritorious paper dealing with the subject of Public Relations in the Electric Light and Power Industry.

LINDEMANN PRIZE—Electric Cookery

Cash prizes of $150, $100 and $50 donated by Mr. A. L. Lindemann, Vice-President and General Manager, A. J. Lindemann and Hoverson Company, for the three most meritorious papers dealing with the Advantages of Electric Cookery for Domestic Purposes.

McGRAW PRIZE—Engineering

Cash prizes of $250, $150 and $100 donated by Mr. James H. McGraw, Chairman of Board, McGraw-Hill Publishing Company, for the three most meritorious papers on any Engineering or Technical subject relating to the Electric Light and Power Industry.

The prizes to companies and individuals for accomplishments in specified activities are:

CHARLES A COFFIN AWARD—

Sponsored by the General Electric Company

A Gold Medal, known as the Charles A. Coffin Medal, will be awarded to the public utility operating company within the United States which during the year 1935 has made a distinguished contribution to the development of electric light and power for the convenience and well-being of the public and the benefit of the industry. The Company awarded the medal will also receive $1,000 for its employees' benefit or similar fund.

HUGHES AWARD—

Domestic Electric Cookery Load

A trophy donated by Mr. George A. Hughes, President, Edison General Electric Appliance Company, Inc., to the public utility operating company within the United States which, during the year 1935, has shown the greatest contribution to the development of the Domestic Electric Cookery Load, through promotion, or selling, or both, and cash prizes totaling $1,000 to the individuals responsible for the achievement.

MARTIN AWARD—Rural Electrification

A Bronze plaque donated by Mr. Thomas W. Martin, President, Alabama Power Company, to the public utility operating company within the United States which, during the year 1935, has shown the greatest contribution to the advancement of Rural Electrification-Agricultural advancement within the company's territory due to uses of electricity, development of rural load, cooperation with other agencies, extension of rural lines, organization and plan for conducting rural electric development.

AUGUSTUS D. CURTIS AWARD—Lighting of Buildings

A certificate donated by Mr. Kenneth Curtis, President, Curtis Lighting, Incorporated, in memory of Augustus D. Curtis, the founder and first president of that company, to the public utility operating company within the United States which, during the twelve-month period ending March 1, 1936, has shown the greatest contribution to the advancement of Artificial Illumination of interiors or exteriors of Commercial and Public Buildings, and a cash prize of $250 to the individual or individuals in that company responsible for the achievement.

Papers competing for the first four prizes must be submitted to the Edison Electric Institute by March 1, 1936, and the presentations of accomplishments in competition for the four latter awards must be forwarded to the Institute by April 1, 1936.

The rules and conditions governing the several contests will be published in the October issue of the BULLETIN.

PAPERS ENTERED IN 1935 PRIZE CONTEST TO BE LOANED

The BULLETIN publishes below and on following pages a list of the papers and exhibits entered in the 1935 Prize Awards competition. With the exception of the prize-winning papers (which, insofar as may be practicable, are to be published in the BULLETIN during the year), and the entries for the Coffin, Hughes and Martin Awards which may be inspected at the general offices, the Institute will be glad to loan to any member company or individual any of the papers listed. Application for loans of papers should be made to The Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y. Requests for loans will be filled in the order of receipt.

PRIZE WINNING PAPERS

H. M. Byllesby Prizes

First Prize—R. E. Kerns, Oklahoma Gas and Electric Company, Oklahoma City, Okla.

Second Prize—John H. O'Grady, Chicago District Electric Generating Corp., Chicago, Ill.

Third Prize—Samuel J. Helfman, Philadelphia Co., Pittsburgh, Pa.

B. C. Forbes Prize

Cash Prize—Robert C. Cleminson, Nebraska Power Company, Omaha, Neb.

A. L. Lindemann Prizes

First Prize—Dera Arrington, Oklahoma Gas and Electric Company, Oklahoma City, Okla.

Second Prize—E. Mae Jones, Virginia Electric and Power Co., Richmond, Va.

Third Prize—Anne L. Robertson, Virginia Electric and Power Co., Richmond, Va.

James H. McGraw Prizes

First Prize—J. E. Allen and G. J. Gross, Pennsylvania Water and Power Co., Baltimore, Md.

Second Prize—George G. Guthrie, Detroit Edison Co., Detroit, Mich.

Third Prize—M. L. Waring, New York Edison Co., New York, N. Y.

PAPERS SUBMITTED BY THE FOLLOWING COMPANIES FOR THE COFFIN, HUGHES AND MARTIN AWARDS ARE AVAILABLE FOR INSPECTION AT THE EDISON ELECTRIC INSTITUTE

(*This Group won prizes or honorable mention*)

Charles A. Coffin Award

Gold Medal—The Tennessee Electric Power Company, Chattanooga, Tenn.

George A. Hughes Award

Cup—Florida Power and Light Company, Miami, Fla.

Cash Award—Mr. R. H. Fite, Jr.

Thomas W. Martin Award

Bronze Plaque—Puget Sound Power and Light Company, Seattle, Wash.

(*Other Entries for Coffin, Hughes and Martin Awards*)

Charles A. Coffin Award

The Union Gas and Electric Co., Cincinnati, Ohio
San Joaquin Light and Power Corp., Fresno, Cal.
Utah Power and Light Co., Salt Lake City, Utah
Union Electric Light and Power Co., St. Louis, Mo.

George A. Hughes Award

Georgia Power Co., Atlanta, Ga.
The Edison Electric Illuminating Co. of Boston, Boston, Mass.
Sierra Pacific Power Co., Reno, Nev.
Mesilla Valley Electric Co., Las Cruces, N. M.
Edison Electric Illuminating Co. of Brockton, Brockton, Mass.
El Paso Electric Co., El Paso, Tex.
The Hartford Electric Light Co., Hartford, Conn.
Idaho Power Co., Boise, Idaho
Tennessee Electric Power Co., Chattanooga, Tenn.
Otter Tail Power Co., Fergus Falls, Minn.
Public Service Co. of New Hampshire, Manchester, N. H.
Northern Power & Light Co., Mobridge, S. D.
Cumberland County Power & Light Co., Portland, Me.

Thomas W. Martin Award

Kansas City Power & Light Co., Kansas City, Mo. (Miss Grace Taylor)
Mountain States Power Co., Albany, Ore.

PAPERS WHICH WILL BE LOANED TO MEMBERS

Submitted by	*Employed by*	*Title of Paper*
Ackerman, Bess M.	New York Edison Co., New York, N. Y.	"Public Relations"
Addison, William M.	New York Edison Co., New York, N. Y.	"Public Relations in the Utilities"
Allen, Otis W.	Consumers Power Co., Pontiac, Mich.	"Electricity's Contribution to Community Development"
Amerman, Edward V.	Public Service Electric & Gas Co., Newark, N. J.	"Public Relations and Common Sense"
Ashworth, Paul P.	Utah Power and Light Co., Salt Lake City, Utah	"Butling"
Avery, H. W.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Ayres, Marion	Alabama Power Co., Birmingham, Ala.	"Advantages of Electric Cookery for Domestic Purposes"
Ball, G. A.	New York Edison Co., New York, N. Y.	"Demand Rates and Public Relations"
Becker, Alan D.	Union Electric Light and Power Co., St. Louis, Mo.	"Public Relations in the Light and Power Industry"
Becker, Franklin A.	North American Company, New York, N. Y.	"The Early Bird and the Worm"
Bell, Harry H.	Calgary Power Co., Ltd., Calgary, Alb.	"A Method of Short Term Budget Forecasting and Its Application in an Electrical Utility"
Benezra, Henry	Puget Sound Power and Light Co., Seattle, Wash.	"Anticipating Complaints"
Bicking, Chas. A.	Delaware Power and Light Co., Wilmington, Del.	"The Open Door to Public Favor"
Bird, Lee G.	Commonwealth Edison Co., Chicago, Ill.	"Boiler Room Control"
Bird, Gladys	Oklahoma Gas and Electric Co., Oklahoma City, Okla.	"Advantages of Electric Cookery for Domestic Purposes"
Blasko, Edmund	Detroit Edison Co., Detroit, Mich.	"Public Relations in the Electric Light and Power Industry"
Boesche, Augus C.	New York Edison Co., New York, N. Y.	"Concerning the Importance of Public Relations"
Bollinger, George W.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"A Practical Operating Method of Determining Condenser Cleanliness"
Boothman, Edwin T.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Public Relations"
Breziner, Arthur C.	New York & Queens Electric Light and Power Co., Long Island City, N. Y.	"The Advantages of Electric Cookery for Domestic Purposes"
Briggs, Lena B.	Oklahoma Gas and Electric Co., Enid, Okla.	"The Role of Electricity in Meal Preparation"
Briggs, Lena B.	Oklahoma Gas and Electric Co., Enid, Okla.	"Public Relations Through Employee Contacts"
Brigham, Maitland L.	Public Service Electric and Gas Co., Trenton, N. J.	"Public Relations"
Broach, Culver R.	Alabama Power Co., Montgomery, Ala.	"Public Relations"
Brock, Roland H.	San Diego Consolidated Gas & Elec. Co., San Diego, Cal.	"People Like a Good Scrapper"
Brown, Robert W.	New York Edison Co., New York, N. Y.	"The Page Boy and the Public"
Burke, M. P.	Mountain States Power Co., Marshfield, Ore.	"Public Relations"
Bundy, Lyle S.	Western United Gas and Electric Co., Joliet, Ill.	"Public Relations in the Electric Light and Power Industry"
Burke, W. E.	New York Edison Co., New York, N. Y.	"A Discussion in the Interest of Improved Public Relations"
Carey, James N.	Narragansett Electric Co., Providence, R. I.	"Facts and Figures"
Caverly, Donald P.	Lynn Gas and Electric Co., Lynn, Mass.	"Mutual Confidence"
Chapin, F. J.	New York Power and Light Co., Albany, N. Y.	"Requisites of Fuse Links For Use on Distribution Systems and the Means of Attainment"
Churchman, H. J.	Appalachian Electric Power Co., Charleston, W. Va.	"Cooking vs. Electric Cookery"
Clarke, George C.	New York Edison Co., New York, N. Y.	"Problems of a Public Utility Company Employee in Dealing with the Public"
Clement, Robert	New York Edison Co., New York, N. Y.	"How I Got Her To Say 'Yes'"
Clement, Robert	New York Edison Co., New York, N. Y.	"The Role of Enterprise"
Comins, Alice F.	Pacific Gas and Electric Co., San Jose, Cal.	"Advantages of Electric Cookery for Domestic Purposes"
Conway, Henrietta	Northern States Power Co., Sioux Falls, S. D.	"Advantages of Electric Cookery for Domestic Purposes"
Cope, Willard	Philadelphia Electric Co., Philadelphia, Pa.	"They'll Listen—If You Talk Their Language"
Couy, C. J.	Duquesne Light Co., Pittsburgh, Pa.	"The Parallel Application of Static Condensers for the Improvement of Primary Circuit Voltage. Graphic Solution"
Coyle, Walter E.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Public Relations in the Electric Light and Power Industry"
Cruden, Milton A.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Cummins, W. N., Jr.	Virginia Electric and Power Co., Suffolk, Va.	"Public Relations vs. Public Ownership"
Curtis, Mabel C.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Public Relations in the Electric Light and Power Industry"
Cutting, Joseph W.	Grafton County Electric Light and Power Co., Lebanon, N. H.	"The Public's Relation to the Electric Light and Power Industry"
DeChaine, D. R.	Midland Counties Public Service Corp., Fresno, Cal.	"Electric Cookery"
DeChaine, D. R.	Midland Counties Public Service Corp., Fresno, Cal.	"Public Relations"
DeNagy, Louis C.	New York Power and Light Corp., Albany, N. Y.	"The Effects of Resonance in Electrical Installations"
Derby, Catherine M.	New York Edison Co., New York, N. Y.	"Good Will"
Diehl, Mary A.	Ohio Edison Electric Shop Co., Springfield, Ohio	"Advantages of Electric Cookery for Domestic Purposes"
Dineen, Kenneth H.	Syracuse Lighting Co., Syracuse, N. Y.	"Gas and Electric Utilities and Public Relations"
Downs, E. F.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Easton, Frank A.	San Joaquin Light and Power Corp., Fresno, Cal.	"Public Relations in the Electric Light and Power Industry"
Ebert, John A.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"A Simplified Card System of Maintenance Records"
Edwards, F. E.	San Diego Consolidated Gas and Electric Co., San Diego, Cal.	"Electric Cookery"
Elliott, V. K.	Northern States Power Co., Eau Claire, Wis.	"Public Relations"
Escoe, Thomas	Virginia Electric and Power Co., Norfolk, Va.	"Public Relations"

PAPERS WHICH WILL BE LOANED TO MEMBERS *(Continued)*

Submitted by	*Employed by*	*Title of Paper*
Ferguson, H. F.	Ohio Edison Co., Youngstown, Ohio	"What Can the Utilities do to Combat the Arguments of Politicians and Protect the Investors in Utility Stocks and Bonds?"
Finley, Kellogg G.	Washington Water Power Co., Spokane, Wash.	"Public Relations and the Operating Company"
Fluhr, Fred Wm.	New York & Queens Electric Light and Power Co., Richmond Hill, N. Y.	"Public Relations in the Electric Light and Power Industry"
Flynn, Hugh F.	Pacific Gas and Electric Co., Vacaville, Cal.	"Public Relations as Viewed by an Operating Department Employee"
Fraga, Dorothy F.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Utility Industry"
Frame, Alexander B.	Lynn Gas and Electric Co., Lynn, Mass.	"Customer's Billing"
Frank, Paul A.	Louisville Gas and Electric Co., Louisville, Ky.	"Public Relations in the Electric Light and Power Industry"
Frazer, Wm. E.	San Diego Consolidated Gas & Electric Co., San Diego, Cal.	"The Public Must Know"
Furano, Frank J.	New York Edison Co., New York, N. Y.	"Creating and Maintaining Good Will in Public Relations"
Garrahan, Eva K.	New York & Queens Electric Light and Power Co., Long Island City, N. Y.	"Public Relations in the Electric Light and Power Industry"
Goetz, Milton A.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Experiences in Adjusting Boiler Meters on Large Stoker Fired Units"
Gould, Frank J.	United Electric Light and Power Co., New York, N. Y.	"On the Utility Front"
Grant, James F.	Public Service Electric & Gas Co., Newark, N. J.	"Public Relations in the Electric Light and Power Industry"
Gray, Paul A.	San Diego Consolidated Gas & Electric Co., San Diego, Cal.	"Public Relations in the Electric Light and Power Industry"
Green, C. M.	New York Edison Co., New York, N. Y.	"That Man's Here Again"
Guess, Wilmot J.	New York Edison Co., New York, N. Y.	"Public Relations"
Harman, David	New York Edison Co., New York, N. Y.	"The Importance of Public Relations in Maintaining and Increasing the Business of the Electric Light and Power Industry"
Harris, Franklin L.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Harris, George	El Paso Electric Co., El Paso, Tex.	"Public Relations in the Electric Light and Power Industry"
Hartzell, Sylvia V.	Northern States Power Co., Montevideo, Minn.	"How's Your Back Yard?"
Hecht, Arthur S.	New York Edison Co., New York, N. Y.	"Electric Cooking for Domestic Purposes"
Heikes, Neil E.	Public Service Co. of Northern Illinois, Chicago, Ill.	"Public Relations in the Electric Industry"
Henshaw, H. E.	Ohio Edison Co., Akron, Ohio	"Public Relations"
Henry, Kathleen	Oklahoma Gas & Electric Co., Ardmore, Okla.	"Advantages of Electric Cookery for Domestic Purposes"
Holding, Herbert H.	Public Service Electric & Gas Co., Newark, N. J.	"The Central Station Engineer and the Power Customer"
James, R. L.	Pennsylvania Power Co., Sharon, Pa.	"Electric Cookery Preferred"
Johnstone, Margreatt	Northern States Power Co., Minot, N. D.	"Public Relations in the Electric Light and Power Industry"
Kane, H. F.	Minneapolis General Electric Co., Minneapolis, Minn.	"Frankly Speaking"
Kehoe, John J.	Commonwealth Edison Co., Chicago, Ill.	"A Resolution Governing Public Relations"
Kerley, Cleo	Oklahoma Gas & Electric Co., Oklahoma City, Okla.	"Advantages of Electric Cookery for Domestic Purposes"
Kuhn, Robert J.	New Orleans Public Service Inc., New Orleans, La.	"Converting Liabilities Into Assets"
Lamkin, Bessie	Virginia Electric and Power Co., Richmond, Va.	"Public Relations in the Electric Light and Power Industry"
Lawrence, W. B.	New York Edison Co., New York, N. Y.	"Public Relations"
Leary, Margaret	New York & Queens Electric Light and Power Co., Long Island City, N. Y.	"Public Relations in the Electric Light and Power Industry"
LeBlanc, J. Tilmon	Lynn Gas and Electric Co., Lynn, Mass.	"Vouchers Payable"
Linstid, Georgianna	Virginia Electric and Power Co., Richmond, Va.	"Public Relations"
Little, Joe	San Joaquin Light and Power Co., Dinuba, Cal.	"The New Deal"
Love, Raymond	Northern States Power Co., Chippewa Falls, Wis.	"Whither the Utilities"
Lowrey, Wiley J.	Oklahoma Gas and Electric Co., Oklahoma City, Okla.	"How to Increase the Usefulness of the Accountant in the Electric Light and Power Industry"
Mallory, B. C.	Lynn Gas and Electric Co., Lynn, Mass.	"Experiences with Condenser Tubes"
Manetti, Fernando and Arnold G. Meister	Commonwealth Edison Co., Chicago, Ill.	"A New Deal in Public Relations"
Maxwell, Morrill Y.	Lynn Gas and Electric Co., Lynn, Mass.	"Solid Foundations in Public Relations"
McBride, Francis A.	New York Edison Co., New York, N. Y.	"An Appeal to the Public to Give Reasonable Consideration to the Services Offered by the Public Utility Company"
McCloskey, Lillian	New York Edison Co., New York, N. Y.	"Public Relations"
McKinney, Fred'k R.	Hartford Electric Light Co., Hartford, Conn.	"Public Relations"
McMahon, J. Barrett	San Diego Consolidated Gas and Electric Co., San Diego, Cal.	"Public Relations in the Electric Light and Power Industry"
McMasters, John J.	Lynn Gas and Electric Co., Lynn, Mass.	"Cooperating For Service"
McMillen, D. S.	New York Edison Co., New York, N. Y.	"Public Relations"
McShane, Frank	Commonwealth Edison Co., Chicago, Ill.	"Cooking with Electricity"
Meyer, Clestia	Oklahoma Gas & Electric Co., Oklahoma City, Okla.	"Advantages of Electric Cookery for Domestic Purposes"
Meyer, Herbert W.	Northern States Power Co., Minneapolis, Minn.	"Public Relations in the Electric Utility Industry Today"

PAPERS WHICH WILL BE LOANED TO MEMBERS *(Continued)*

Submitted by	*Employed by*	*Title of Paper*
Monsen, Manley B.	Northern States Power Co., Red Wing, Minn.	"Cooperating for Service"
Morris, Kenneth	Wisconsin Public Service Corp., Manitowoc, Wis.	"Public Relations in the Electric Light and Power Industry"
Murtland, J. B.	Philadelphia Electric Co., Philadelphia, Pa.	"Advantages of Electric Cookery for Domestic Purposes"
Nelson, Edward J.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
O'Connor, C. E.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Ollinger, C. F.	West Penn Power Co., Pittsburgh, Pa.	"Public Relations"
Petterson, Gustav E.	New York and Queens Electric Light and Power Co., Flushing, N. Y.	"A Synchronous Phase Indicator"
Phillipson, Agnes	Wisconsin Public Service Corp., Oshkosh, Wis.	"Advantages of Electric Cookery for Domestic Purposes"
Pisell, Elsie	Oklahoma Gas and Electric Co., Enid, Okla.	"Advantages of Electric Cookery"
Poutie, Beryl I.	Buffalo General Electric Co., Buffalo, N. Y.	"The Advantages of Electric Cookery for Domestic Purposes"
Priestman, John	British Columbia Electric Railway Co., Ltd., B. C.	"The Advantages of Electric Cookery"
Qualls, Eugene H.	Union Electric Light and Power Co., St. Louis, Mo.	"Public Relations in the Electric Light and Power Industry"
Quinn, Eileen F.	Edison Electric Illuminating Co., Boston, Mass.	"Electric Cookery As An Aid to Social Poise"
Ravenel, Daniel, Jr.	So. Carolina Power Co., Charleston, S. C.	"Private Power Must Be Preserved"
Ray, Jeanette	Virginia Electric and Power Co., Fredericksburg, Va.	"Rosa Puts Her Foot Down"
Reese, Lewis	Pacific Gas and Electric Co., Stockton, Cal.	"Testing of Low Head Pumping Plants"
Reynolds, Lawrence B.	Byllesby Engineering & Management Corp., North Bend, Ore.	"Public Relations in the Elec. Light and Power Ind."
Rose, Ferdinand D.	Public Service Electric & Gas Co., Burlington, N. J.	"Public Relations in the Electric Light and Power Industry"
Rundell, Wright R.	San Diego Consolidated Gas and Electric Co., San Diego, Cal.	"Public Relations"
Saponaro, Francis P.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Sargent, Norwood V.	Edison Electric Illuminating Co., Boston, Mass.	"Means of Obtaining and Keeping Good Public Relations"
Sawyer, O. E.	New England Power Engineering and Service Corp., Providence, R. I.	"An Economical Substation Design"
Saunderson, George E.	New York Edison Co., New York, N. Y.	"Black Varnished Cloth As An Insulating Tape"
Schmid, Ad	Pacific Power and Light Co., Yakima, Wash.	"The Advantages of Electric Cookery for Domestic Purposes"
Schroeder, Margaret	Edison Light and Power Co., York, Pa.	"Advantages of Electric Cookery for Domestic Purposes"
Shaney, Desire	Wisconsin Public Service Corp., Minocqua, Wis.	"Public Relations in the Light and Power Industry"
Schief, Eugene R.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"The Public Reaction to Our Industry and the Resulting Problems"
Shenk, David P.	Lynn Gas and Electric Co., Lynn, Mass.	"Credit and Collections"
Shoemaker, Elizabeth	Detroit Edison Co., Burmingham, Mich.	"The Advantages of Electric Cookery for Domestic Purposes"
Simpson, Richard J.	New York Edison Co., New York, N. Y.	"The Public Versus Public Utilities"
Sinnot, Joseph F.	San Diego Consolidated Gas and Electric Co., San Diego, Cal.	"Rapid Location of Faults on Underground High Voltage Cables"
Skrotzki, Bernhardt G.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Proposed Method of Determining Change in Fuel Bed Depth During Boiler Tests"
Slack, Jesse R.	Virginia Electric and Power Co., Norfolk, Va.	"Public Relations in the Electric Light and Power Industry"
Sleight, R. L.	Commonwealth Edison Co., Chicago, Ill.	"Diesel Engines Versus Utilities"
Small, Henry F.	Consumers Power Co., Grand Rapids, Mich.	"Give That Ye May Also Receive—An Extended Policy for Utilities"
Smith, E. A.	California Oregon Power Co., Medford, Ore.	"Public Relations"
Stabler, Kenneth T.	Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.	"Convenience Outlet Box"
States, Mrs. Emma	Puget Sound Power and Light Co., Seattle, Wash.	"Advantages of Electric Cookery for Domestic Purposes"
Steffenauer, Louis G.	Public Service Electric and Gas Co., Newark, N. J.	"Public Relations in the Electric Light and Power Industry"
Stein, Eugene M.	New York Edison Co., New York, N. Y.	"Understanding—The Foundation Upon Which Friendship is Built"
Steinberg, Max J.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"What Price For Standby Service?"
Stermer, H. G.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Accounting Treatment and Internal Audit Procedure in the Handling of Petty Cash in an Electric Light Utility"
Stermer, H. G.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"The Creating of a Proper State of Public Mind in Regard to Public Utilities"
Steube, Elmer H.	Union Electric Light and Power Co., St. Louis, Mo.	"Public Relations"
Stevens, Walter E.	Public Service Electric and Gas Co., Bound Brook, N. J.	"Electric Cookery and Its Advantages"
Stevens, Lola A.	Appalachian Electric Power Co., Roanoke, Va.	"Electric Cookery"
Stoner, Dexter	Western United Gas & Electric Co., Aurora, Ill.	"The Human Factor As An Aid to Public Relations"
Sykes, W. E.	Bell Telephone Co. of Canada, Toronto, Can.	"Induction From Balanced and Residual Currents of Power Systems"
Taber, Leonard S.	Narragansett Electric Co., Providence, R. I.	"A Board of Public Relations of the Edison Electric Institute"
Taylor, Grace L.	Kansas City Power and Light Co., Kansas City, Mo.	"The Advantages of Electric Cookery for Domestic Purposes"

PAPERS WHICH WILL BE LOANED TO MEMBERS (Continued)

Submitted by	*Employed by*	*Title of Paper*
Thieman, V.	Wisconsin Public Service Corp., Green Bay, Wis.	"This Kilowatt-Hour Went to Market"
Tobin, Grace E.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
Tyson, Peggy	Puget Sound Power and Light Co., Wenatchee, Wash.	"Just Imagine"
Vaiden, Henry E.	New York Edison Co., New York, N. Y.	"The Consideration of Fixed Charges in an Engineering Economy Study"
VandenBerg, Gertrude J.	Illinois Northern Utilities Co., Morrison, Ill.	"Public Relations in the Electric Light and Power Industry"
Vandervelde, Harold	Commonwealth Edison Co., Chicago, Ill.	"The Discontinuance of Electric Service for Nonpayment of Accounts and the Maintaining of Public Good-Will"
VanEvera, Jean	Kansas City Power and Light Co., Kansas City, Mo.	". . . . Founded Upon a Rock"
Villa, Mrs. Amy	Idaho Power Co., Twin Falls, Idaho	"Do Women Have a New Era?"
Vogt, Leslie C.	Pacific Gas and Electric Co., San Jose, Cal.	"Public Relations in the Electric Light and Power Industry"
Vogt, William B.	New York Edison Co., New York, N. Y.	"The Complaint Adjuster As An Ambassador of Good Will"
Vosbrink, Oscar J.	Union Electric Light and Power Co., St. Louis, Mo.	"Public Relations in the Electric Light and Power Industry"
Wagner, Harold E.	Public Service Electric and Gas Co., Newark, N. J.	"Good Individual Relations Breed Good Public Relations"
Walker, Lawrence M.	New York Edison Co., New York, N. Y.	"Public Relations"
Wallace, Everett H.	Commonwealth Edison Co., Chicago, Ill.	"Public Relations in the Electric Light and Power Industry"
Wardenburg, H. A.	Commonwealth Edison Co., Chicago, Ill.	"Management Information For Employees and Public"
Washa, Anthony P.	New York Edison Co., New York, N. Y.	"Public Relations"
Wegel, Fred C.	New York Edison Co., New York, N. Y.	"Public Relations in the Electric Light and Power Industry"
West, Frank T., Jr.	New York Edison Co., New York, N. Y.	"Applied Public Relations"
West, Alfred R.	Public Service Co. of Northern Illinois, Chicago, Ill.	"The Best Answer to the Question of the Price of Electric Light and Power Service"
Wilhite, Richard D.	Charles H. Tenney & Co., Boston, Mass.	"We, The People"
Williams, Ruth W.	Detroit Edison Co., Detroit, Mich.	"Advantages in Electric Cookery for Domestic Purposes"
Wilson, Augustus T.	Public Service Electric and Gas Co., Newark, N. J.	"The Utilities At the Crossroads"
Wiltshire, Norma E.	West Penn Power Co., Charleroi, Pa.	"Public Relations"
Wine, Victoria	Appalachian Electric Power Co., Roanoke, Va.	"Public Relations in the Electric Light and Power Industry"
Winston, Charles R.	Virginia Electric & Power Co., Richmond, Va.	"Public Relations in the Electric Light and Power Industry"
Woodson, Walter R.	Kansas City Power and Light Co., Kansas City, Mo.	"The Golden Opportunity of Public Relations"
Wright, Carleton N.	Indiana General Service Co., Hartford City, Ind.	"Public Relations"
Zeglio, Leon P.	Brooklyn Edison Co., Inc., Brooklyn, N. Y.	"Features in the Hudson Avenue Electrical Auxiliary Installation"

RECENT E.E.I. PUBLICATIONS

COMBUSTION—1935

E.E.I. Pub. C-6. A report of the Prime Movers Committee, Edison Electric Institute, 49 pages. Price 80c to members and their employees; $2.00 to non-members in the U.S.A.; $2.15 to foreign countries.

This report is confined largely to operating problems, and to changes and improvements which have been made to existing equipment. The period of inactivity in new plant construction has continued to urge manufacturers to further development work. Numerous improvements have been made and some entirely new equipment has been developed. The report contains statements by the Committee, Operating Companies, and Manufacturers on: Combustion of Oil and Gas Fuels, Combustion Control, Furnaces (other than pressure parts of water-cooled furnaces), Stokers, Ash and Dust Elimination and Ash Disposal Equipment, Mechanical Draft Equipment, Pulverizers and Pulverized Fuel.

AIR CONDITIONING—1935

E.E.I. Pub. C-7. A report of the Sales Committee, Edison Electric Institute, 24 pages. Price 50c to members and their employees; $1.25 to non-members; $1.35 to foreign countries.

This report contains specific data on typical air conditioning installations in banks, hotels, offices, office buildings, printing plants, residences, restaurants, stores, and undertaking establishments in various sections of the country. Information on each installation as to the size and character of equipment and the purpose to be achieved is given, together with hours of operation, maximum demand, energy consumption, and other factual data. The data presented is expected to initiate the regular exchange of information on existing installations.

Statements from manufacturers giving their views on the cooperation which public utilities can render in promoting the use of air conditioning equipment are included in the report.

The 'Trouble Shooters'

"Someone should recognize the work of the maintenance men who keep utilities in operation. . . . Every consumer expects light when he presses the button or an answer when he uses the telephone. He rarely thinks of the skill, courage and effort which must be always available in the organization which furnishes these facilities.

" 'Trouble shooters' are the men who ride an emergency truck at any hour of the day or night, to restore service when lightning plays hob with transformers, wind crashes limbs across wires or other effects of the weather are felt. The outstanding characteristic of their work is that usually it must be done when conditions are at the worst. Trouble throws them into action and the things which make trouble usually are unpleasant.

"It requires nerve, judgment and physical ability to handle a broken power line in the dark, when rain, wind, and sputtering wires provide the essentials of injury or sudden death. But these men rarely falter. They deserve to be numbered among the unsung heroes of an industrial age. They are an answer to those who think that modern life lacks elements of risk, romance and adventure."—*Utica, N. Y., Press.*

Analysis of Lighting Voltage by States

By G. S. Merrill

Nela Park Engineering Department, General Electric Company

A DETAILED analysis of the information on service voltages contained in the voltage booklets issued by the manufacturers of incandescent lamps (which serve as a guide in the distribution of their product) appeared in the EDISON ELECTRIC INSTITUTE BULLETIN of August, 1933, page 144, and a similar analysis, as of July 1, 1934, was printed in the BULLETIN of September, 1934.

The figures appearing herein are as of July 1, 1935, and are based on the latest information available. The voltage trend for the past five years is shown by the following summary:

PER CENT OF POPULATION LISTED SERVED AT DIFFERENT VOLTAGES

Voltage	1923	1928	1933	1934	1935
110	36.3	15.9	5.2	3.6	3.3
115	40.9	61.6	61.7	61.3	60.6
120	19.4	22.4	33.0	35.0	36.0
All Others	3.4	0.1	0.1	0.1	0.1
	100.0	100.0	100.0	100.0	100.0
Average (1st three items only)	114.1	115.3	116.4	116.6	116.6

National Safety Council Congress Meeting

THE Twenty-fourth Annual Safety Congress and Exposition of the National Safety Council will be held in Louisville, Kentucky, October 14 to 18. Twenty-six industrial Sections and five subject Sections of the Organization will conduct programs consisting of lectures, papers and discussions. Also, programs have been arranged for several industrial subjects. Speakers of national prominence have been secured for several of the general sessions. The meetings will be held at the Brown, Kentucky, Seelbach and Henry Watterson hotels. Extensive exhibitions of safety and accident prevention equipment and materials will be on display.

Accident prevention and safety subjects scheduled for discussion at this Congress which should be of interest to electric utility men are: Public utilities, engineering, construction, street and highway traffic and industrial health.

Reduced railroad fares have been granted by all steam railroads. Those expecting to avail themselves of this reduction in rates should communicate with the National Safety Council, 20 North Wacker Drive, Chicago, for reduced fare certificates. Hotel reservations and Registration for the Congress are requested before October 1st.

TABLE I—ANALYSIS OF LIGHTING SERVICE VOLTAGE BY STATES

Division and State	Population of Cities and Towns Listed in Voltage Book	Ave. Voltage Weighted According to Population Served	Percentage of Population Listed in Voltage Books Served at 110	115	120	125	130	All Others*
New England								
Maine	735,000	115.5	7.3	75.6	17.1	..	..	..
New Hampshire	486,700	116.7	1.4	64.2	34.4	..	..	..
Vermont	318,900	115.4	.7	90.9	8.1	.3	..	.1H
Massachusetts	4,453,400	115.2	5.4	85.3	9.3	..	..	..
Rhode Island	683,300	115.8	1.1	82.7	16.2	..	..	..
Connecticut	1,622,700	116.2	2.5	70.4	27.1	..	..	..
Middle Atlantic								
New York	12,024,900	118.7	1.9	21.3	76.8	..	.	..
New Jersey	3,809,900	119.1	.8	16.6	82.6	..	..	..
Pennsylvania	7,722,200	115.2	.8	93.6	5.6	..	..	..
East North Central								
Ohio	5,272,500	115.9	.6	81.2	18.2	..	..	..
Indiana	1,843,400	115.8	8.8	67.7	22.8	.3	.3	.1H
Illinois	6,377,000	115.0	.7	98.0	1.3	..	..	..
Michigan	3,845,400	117.1	1.5	54.6	43.9	..	..	..
Wisconsin	2,052,300	117.4	1.7	48.7	49.6	..	..	..
West North Central								
Minnesota	1,643,000	116.2	2.0	71.4	26.6	..	..	..
Iowa	1,421,900	114.2	21.6	72.9	5.5	..	..	..
Missouri	2,257,500	115.1	.4	97.8	1.8	..	..	..
North Dakota	269,000	115.5	1.0	87.0	11.9	..	..	..
South Dakota	280,400	114.9	5.4	90.7	3.5	.4	..	..
Nebraska	718,800	116.8	4.2	56.4	39.2	.1	..	.1H
Kansas	1,020,300	115.5	2.5	86.3	11.1	..	.03	.03H
South Atlantic								
Delaware	165,800	118.7	3.2	19.6	77.2	..	..	..
Maryland	1,182,600	118.6	2.2	23.8	74.0	.	..	..
District of Columbia	486,900	115.0	..	100.0	..	..	..	..
Virginia	1,140,100	116.3	2.1	49.9	48.0	..	..	..
West Virginia	840,300	115.0	.3	99.3	.4	..	..	..
North Carolina	1,084,800	116.8	4.5	54.6	40.9	.	..	.
South Carolina	532,600	115.0	5.0	90.5	4.5	..	..	..
Georgia	1,146,900	115.7	3.5	78.9	17.6	..	..	..
Florida	947,700	115.1	6.2	85.4	8.4	..	..	..
East South Central								
Kentucky	1,037,400	117.0	7.1	43.8	48.3	..	..	.8L
Tennessee	1,132,900	115.4	3.4	84.8	11.8	..	..	..
Alabama	1,037,700	116.2	2.2	70.9	26.9	..	..	..
Mississippi	555,900	115.7	.9	85.2	13.6	.1	..	.2H
West South Central								
Arkansas	551,400	115.7	3.6	83.0	9.7	3.7	..	..
Louisiana	991,600	118.0	5.5	30.6	63.6	.05	.25	..
Oklahoma	1,171,300	118.3	2.3	29.9	67.8	..	..	..
Texas	3,037,000	117.7	.9	44.4	54.7	..	..	..
Mountain								
Montana	267,400	116.8	6.0	51.9	41.5	.19	..	..
Idaho	216,600	119.4	2.8	6.1	91.1	..	..	..
Wyoming	1,037,700	116.2	2.2	71.0	26.8	..	..	..
Colorado	667,900	116.3	1.7	70.6	27.7	..	..	..
New Mexico	260,800	115.2	2.4	90.0	6.8	..	.	
Arizona	235,600	116.0	11.7	56.2	32.1	..		
Utah	412,300	119.4	1.3	9.6	88.8	..	.	
Nevada	65,300	114.3	14.2	85.8	..	..	..	..
Pacific								
Washington	1,166,500	119.8	.3	4.4	95.2	..	..	..
Oregon	632,800	119.7	.4	5.6	94.0	..	..	..
California	4,834,600	116.4	17.4	37.9	44.6	..	..	..
U. S. Total and Averages	85,698,900	116.64	3.34	60.58	36.00	.04	.02	.01

H—above 130 L—below 110 Not included in Average.

POWER SALES ITEMS

AIR CONDITIONING

"Air Conditioning for Meat Packing Plants." National Provisioner, August 10, 1935, p. 13. National Provisioner, Inc., Publishers, 407 S. Dearborn Street, Chicago, Ill.

Why it is necessary and where it should be applied in meat plants.

"Air Conditioning in Plating and Lacquering Rooms." Electric Refrigerating News, July 17, 1935, p. 7. Business News Publishing Co., 550 Maccabees Building, Detroit, Mich.

Marked advantages in plating and lacquering rooms discussed.

"Estimating Air Conditioning Loads." Heating, Piping and Air Conditioning, August, 1935, p. 391. Keeney Publishing Co., 6 North Michigan Avenue, Chicago, Ill.

A rational method of determining its character and magnitude.

"Hotel Air Conditioning." Hotel Monthly, July, 1935, p. 24. John Willy, Inc., Publisher, 950 Merchandise Mart, Chicago, Ill.

Description of system installed in nine-year-old hotel without interruption of business.

"Air Conditioning in Brewery." Heating, Piping and Air Conditioning, July, 1935, p. 352. Keeney Publishing Co., 6 North Michigan Avenue, Chicago, Ill.

Description, photographs and sketches of successful installations at Molson's Brewery, Montreal.

"Quiet Fans for Air Conditioning," by A. Warren Canney, Air Conditioning Engineer, New York. Power, August, 1935, p 424. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

Eighth of a series of articles on air conditioning. This article deals with the factors that influence fan selection and how they are put to practical use.

"Air Conditioning a Large Chocolate Factory." Ice and Refrigeration, September, 1935, pp. 107-109. Nickerson & Collins Company, Publishers, 435 North Waller Avenue, Chicago, Ill. New York Office, 520 Singer Building.

Illustrated description of air conditioning equipment installed in chocolate and cocoa plant of Blumenthal Bros., Philadelphia, Pa.; list of refrigerating equipment; flexible set-up provided; air conditioned by Braemer dehumidifiers on each of three floors; perishables stored on third floor.

CEMENT PLANTS

"Electricity for Cement Manufacture." Rock Products, August, 1935, p. 33. Tradepress Publishing Corporation, 542 South Dearborn Street, Chicago, Ill.

Detailed description of the electric applications in the newest cement plant in the United States at Broadhead, Pa.

DIESEL ENGINES

"Diesel Engines." Review of Reviews, August, 1935, p. 45. Review of Reviews Corporation, Publishers, 55 Fifth Avenue, New York City.

Their many uses noted and advantages compared to those of other prime movers.

ELECTRIC FURNACES

"Electric Heat Treatment," by George H. Hall, Consulting Engineer, New York. Electrical World, August 31, 1935, pp. 24-26. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

Electric furnaces take form of boxes, pits, hearths, pots and draw cabinets for variety of treatment processes.

ELECTRIC STEAM GENERATION

"Production of Steam from Electric Energy," by C. R. Reid, Asst. General Superintendent, Shawinigan Water & Power Company. Electrical News and Engineering, September 1, 1935, pp. 19-21. Hugh C. MacLean Publications Limited, 347 Adelaide Street, West, Toronto, Canada.

In localities where hydro-electric power is abundant and steam loads are readily available, the production of steam from electric energy has proved to be a highly satisfactory means of utilizing surplus and off-peak power. This method of producing steam is particularly advantageous where cleanliness is important and in small establishments having intermittent demand for steam. In Canada the total installed capacity of such equipment exceeds 1,500,000 kw.

HEATING

"Design, Installation and Operation of an Institutional Heating Plant," by C. J. Eckhardt. Heating and Ventilating Magazine, July, 1935, p. 53. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

A million dollar heating plant at the University of Texas generates power as a by-product.

INDUSTRIAL CUSTOMERS

"Service to Industrial Customers," by W. E. Mitchell, Vice President & General Manager, Georgia Power Company. Electrical World, June 8, 1935, p. 67. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

No class of power consumers is in a better position to demand high quality electric service than the large industrial power customers. Mr. Mitchell relates the results of an intensive study of the causes of industrial customers' complaints and the method of solving the problems.

IRRIGATION

"Electricity for Irrigation Purposes." Electrical Production, June, 1935, p. 13. Electrical League of Cleveland, Inc., Builders Exchange Building, Cleveland, Ohio, Publishers.

Advantages and applications of electric water pumps in simplifying irrigation problems.

MODERNIZATION

"Modernization Improves Rentals." Heating, Piping & Air Conditioning, May, 1935, p. 237. Keeney Publishing Company, 6 North Michigan Avenue, Chicago, Ill.

Air conditioning and modern lighting for offices and commercial establishments improves their renting.

POWER COSTS

"Watch Maximum Demand to Cut Power Costs," by John M. Acheson. Power, May, 1935, p. 244. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

Power engineers will be interested in this article because it points out ways of limiting maximum demands, etc., thereby saving the purchaser of power money on his demand charge. The limiting of maximum demand is of interest to nearly every purchaser of power, and this article is written for the plant operator.

POWER FACTOR

"What Limit P. F. Correction?" by C. W. Drake. Factory Management and Maintenance, June, 1935, p. 254. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

Correction to unity power factor is easy enough, but it seldom pays to go beyond the point of maximum return on investment.

POWER LOSSES

Article I of a series by T. A. Bissell on Mechanical Transmission and Plant Maintenance. Southern Power Journal, August, 1935, pp. 37-39. W. R. C. Smith Publishing Company, Grant Building, Atlanta, Ga.

This series of articles will deal with power losses in mechanical transmission outlining various types of wastes and corrective methods.

POWER PLANTS

"Economy in the Generation and Use Power and Steam," by L. Helander. Power Plant Engineering, May, 1935, p. 274. Technical Publishing Company, 53 West Jackson Blvd., Chicago, Ill.

POWER SALES

"Best Power Prospects Existing Customers," by R. D. Hayes. Electrical World, July 20, 1935, p. 66. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

A chart constructed from the figures published in the Electrical World of January 5, 1935, showing the electrical consumption taken by various sources of increased load in 1934, indicates that existing customers constitute the most fertile field in which to cultivate additional power revenue.

PUMPING

"Automatic Pumping Control Features Central States Waterworks Meeting." Engineering News-Record, August 29, 1935, p. 307. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

Digest of a paper by S. A. Canariis, Electrical Engineer of the Pittsburgh water department, dealing with automatic and remote-controlled electrically operated pumping stations.

VENTILATION

Ventilating New York's Largest Post Office," by Harold L. Alt, Power, July, 1935, p. 354. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City.

October Meetings

(Continued from page 350)

In addition to the regular work of the committee as carried on by its four subdivisions, a full session will be devoted to a thorough presentation and review of the problems involved in supplying air conditioning load, including a presentation relating to the probable magnitudes and natures of the loads to be expected.

Prime Movers Committee

P. W. THOMPSON, Chairman

THE first meeting of the Prime Movers Committee for the season 1935-1936 will be held at the Shoreham Hotel, Washington, D. C., on Monday and Tuesday, Oct. 14 and 15, 1935. Among the various items of general business the subjects of super-imposition of high pressure units on old plants, and boilers, combustion and turbine, will be considered. The committee will also utilize the occasion for an inspection of the Buzzard Point plant of the Potomac Electric Power Company.

The Hydraulic Power Committee is also holding its first meeting of the season at the Shoreham Hotel on Sunday and Monday, Oct. 13 and 14, and it has been arranged that the meeting will be conducted, in part, as a joint meeting, so that members of the Prime Movers Committee may attend the Hydraulic Power Committee's sessions on Sunday, Oct. 13.

Accident Prevention Committee

W. A. BUCHANAN, Chairman

The Accident Prevention Committee of the Edison Electric Institute will hold its next meeting at the Brown Hotel in Louisville, Ky., Monday, Oct. 14, at 9:30 a. m., during the week of the 24th Annual Safety Congress of the National Safety Council. This meeting has been scheduled so as to avoid conflict with either of the sessions of the Public Utilities Section.

Several items of important business left over from the Pittsburgh meeting will be discussed and other new developments in the committee's work appear on the agenda.

The attendance of every member is desired in order to further advance our program.

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CONVENTIONS AND MEETINGS

SEPTEMBER

3-6 Illuminating Engineering Society, Netherland Plaza Hotel, Cincinnati, Ohio.
4-6 Pennsylvania Electric Association, Bedford Springs, Pa.
9-11 Rocky Mountain Electrical Association, Stanley Hotel, Estes Park, Colo.
17 Sales Committee, The Greenbrier, White Sulphur Springs, W. Va.
18-28 National Electrical and Radio Exposition, Grand Central Palace, New York.
23-25 National Electrical Contractors Association, Chicago, Ill.
23-27 American Transit Association, Atlantic City, N. J.
30 American Institute of Mining & Metallurgical Engineers, Chicago, Ill.

OCTOBER

1-4 American Institute of Mining and Metallurgical Engineers, Chicago, Ill.
4-5 Empire State Gas and Electric Association, Westchester Country Club, Rye, N. Y.
7-8 Electrical Equipment Committee, Edgewater Beach, Hotel, Chicago, Ill.
7-11 National Electrical Manufacturers Association, Chicago, Ill.
9-11 Transmission and Distribution Committee, Edgewater Beach Hotel, Chicago, Ill.
13-14 Hydraulic Power Committee, Shoreham Hotel, Washington, D. C.
14 Accident Prevention Committee, Brown Hotel, Louisville, Ky.
14-15 Prime Movers Committee, Shoreham Hotel, Washington, D. C.
14-17 American Gas Association, Palmer House, Chicago, Ill.
14-18 National Safety Council, Louisville, Ky.
14-18 National Electrical Wholesalers Association, Chicago, Ill.
15-18 National Association of Railroad and Utilities Commissioners, Nashville, Tenn.

JANUARY, 1936

28-31 American Institute of Electrical Engineers, New York, N. Y.

Hydraulic Power Committee

C. F. MERRIAM, Chairman

THE first meeting of the Hydraulic Power Committee for the season 1935-1936 will be held at the Shoreham Hotel, Washington, D. C., on Sunday and Monday, Oct. 13 and 14, 1935. This meeting has been arranged as a joint meeting with the Prime Movers Committee, which is also holding its first meeting for the season on Monday and Tuesday, Oct. 14 and 15, at the same hotel. It is expected that members of the Prime Movers Committee who desire to do so will attend the sessions of the Hydraulic Power Committee on Sunday, and in a similar manner members of the Hydraulic Committee may attend sessions of the Prime Movers Committee when their own committee is not in session.

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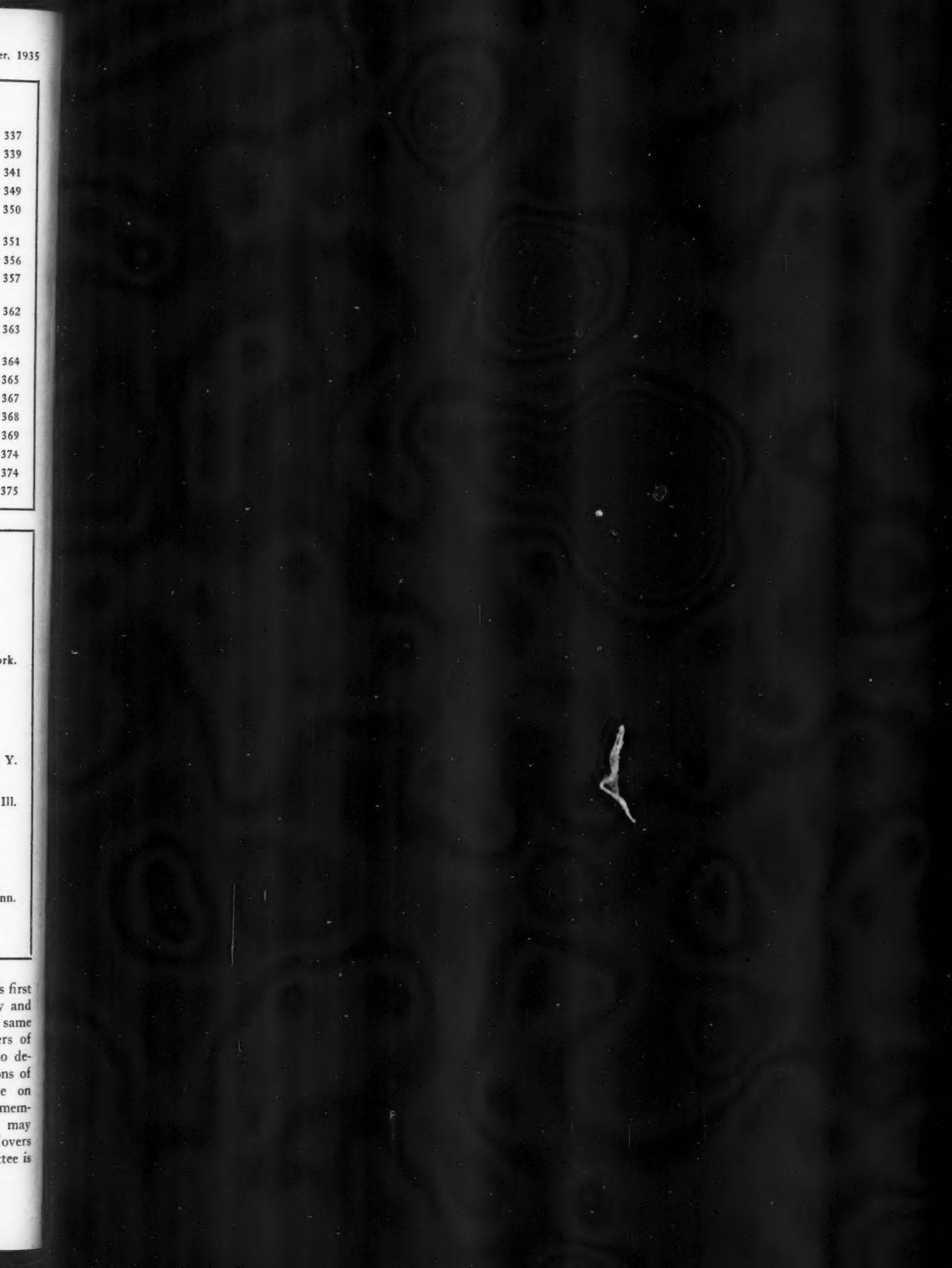
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